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THE SURGICAL TREATMENT OF FOCAL EPILEPSY.[1]

A CRITICAL ANALYSIS OF THE RESULT IN NINETEEN CASES.

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During the past six years we have attempted to decide in a thoroughly unbiased fashion the results of the various surgical procedures adopted for the cure, or relief, of partial epilepsies. The term, partial or focal epilepsy, is used advisedly in order to include not only the cases of traumatic origin, but those as well in which localized convulsions are associated with other diseases, more particularly with early infantile cerebral palsies. However different the etiological factor in these two groups of cases may be, they have at least this in common—that a circumscribed cortical lesion is the cause of the epilepsy. The results to be recorded in this article are based upon nineteen cases. The list includes ten which were discussed in a brief paper published by us in The American Journal of the Medical Sciences, November, 1892. At the conclusion of that article we stated that the prospects were "rather gloomy, and that the successful cases will probably be those in which there was some tangible organic lesion which has been removed at a very early period, or those cases in which, after traumatic injury to the skull, trephining has been done before the effect of the depression of the skull has resulted in the development of epilepsy." The experience of later years has taught us that this statement was a just one, and that the views then expressed still hold good; but we have gradually been convinced that if the cases for operation are selected more carefully, and if the surgical technique is perfected, the

[1] Read at the meeting of the American Neurological Association, June, 1896.

prognosis need not be stated quite so gravely, and that it is possible not only to relieve many, but to cure *some* of the cases of epilepsy.

In Europe and on this continent the results of the surgical treatment of epilepsy have been pictured in rather depressing colors.[1] It is for the purpose of combating the tendency to cry down surgical interference in epilepsy that we wish to present the critical analysis of the results in a large series of cases. It is well to be extremely sceptical in the discussion of this question, yet we should remember that we are dealing with one of the saddest afflictions of mankind; and if only a small percentage of these unfortunate individuals is improved, the gain is a great one, more particularly since the operative procedures, if properly carried out by competent men, are not serious—at least are not apt to be fatal. In only a single one of the cases operated on by Gerster could the death be attributed directly to the operation, and in this (Case 15) the operation was the third one performed upon the patient, and the loss of blood upon incising the old and thickened scar was in all probability the cause of death. In two other cases the death was not to be attributed to the operation, for the one patient (Case 17) died several months later, and in this instance a cyst underlying the entire hemisphere was encountered, the fatal termination being the result of the gradual draining away of an enormous amount of cerebrospinal fluid. The third patient was doing extremely well after the operation, but on the removal of the dressings by an interne of the hospital some weeks after the operation a septic meningitis was set up, to which the patient succumbed (Case 18).

Although it would be extremely desirable to analyze the results of operations for epilepsy as recorded by a large number of authors, the attempt to do this is of very little value. Dr. Wiener was kind enough to analyze all the operative cases reported in the *Index Medicus* for the year 1893. From among these only a very few were reported in such a fashion that any inference could be made from the results obtained. Mason[2] also has been compelled to exclude thirty-eight of seventy cases for the simple reason that the authors had recorded their cases before a sufficient period of time had elapsed after the operation. It is the entire lack of careful analysis that makes so many records and statistical inquiries absolutely worthless.[3]

A few years ago we were of the opinion that it was justifiable to make an early report of the negative result in those cases in which the

[1] *Cf.* Bergmann: Berl. klinische Wochenschr., April 22, 1895. Eulenburg: ibid., April 15, 1895. Jolly: Charité Annalen, Jahrgang xx.

[2] Medical News, March 21, 1896.

[3] A brilliant exception to this is offered by the work of A. Broca and Maubrac (Chirurgie Cérébrale) which has just come into my (Sachs') hands after the above was written. It is a particular satisfaction to note that our conclusions are largely in accord with the conclusions reached by these authors, who have not merely piled up statistics, but have analyzed with a great deal of discrimination the reports made by the surgeons and neurologists of Germany, France, England, and America.

epileptic attacks returned very promptly after the operation; but even this procedure is not absolutely correct, for in several instances a decided improvement set in later on. We wish particularly to emphasize the fact that the return of attacks in the first few days after the operation does by no means prove that the surgical procedure adopted has been a failure. On the whole, the judgment of many physicians seems to have been warped with respect to this question. A number of authors have insisted that the claim to surgical success shall be denied in all those cases in which sedatives have been given after the operation. It is certain that every physician would insist upon the administration of bromides or opium or chloral after any serious cerebral operation—*e. g.*, the incision of a cerebral abscess, etc.; but in the case of epileptic patients, whose brain is characterized by unusual excitability, the demand is made that such drugs shall not be administered, and apparently for no other reason than that of being able to decide whether the improvement is actually due to the operation or due to the drugs administered. But, as physicians, we have a duty not only toward science, but above all toward the patient; we have thought it, therefore, to be of the greatest importance after every cerebral operation to keep the brain at rest for a period of at least a week or two. If, after the lapse of weeks or months, the epileptic attacks have been diminished in number, it can hardly be claimed that the drugs administered during the first week or two, or possibly for a longer period, have had anything to do with the ultimate result, except that they have helped to diminish the shock of the operation.

We are ready to agree with those who insist that no case of epilepsy can be said to be cured unless the patient has been entirely free from all attacks for a period of at least one year. Possibly this period should be extended even to three years. But, on the other hand, it is neither just nor prudent to put every negative case in evidence against the utility of operative interference. Let me recall the interesting case of Jolly (*loc. cit.*), referring to a patient who had been addicted to alcoholism for many years and who had sustained a severe subdural hemorrhage during the first operation, which was attempted for the relief of epilepsy. Knowing the importance of alcohol as an etiological factor in epilepsy, we cannot expect surgical interference to cure epilepsy as readily in persons subject to this special habit as in those who have never been addicted to it.

We are willing to concede that surgical procedures will avail but little in the majority of cases; for that very reason it is all the more important that we should endeavor to select the few cases in which recovery is possible. In order that we may be able to formulate an opinion on this subject, we have concluded that it will be best not only to report successes or failures, but carefully to record all cases observed by ourselves and to tabulate them in such a way that the reasons for success in some and failure in others will become apparent.

But before we discuss the results obtained by us, a number of mooted points must be briefly considered. Trephining may be said to be the classical form of surgical interference in the treatment of epilepsy; but with the greater skill attained in cerebral surgery, incision of the dura, removal of old scars, and, above all, excision of diseased cortical tissue, have been practised. The effect of simple trephining in the case of depression or other injuries to the skull can be readily explained. If it does nothing more, it serves to loosen old adhesions or to diminish locally increased pressure. If a cystic condition exists, as is so often the case after traumatic injuries and in the epilepsies associated with cerebral infantile palsies, the good results following upon trephining can be easily understood. The operation *per se* may have a good effect in some cases; but I cannot go the length to which some German authors have gone in supposing that the good effect of surgical procedures in many of these cases is simply due to suggestion. The theory of suggestion will certainly not be able to bear this additional charge.

Horsley's proposition, to excise the diseased cortical tissue, is based upon sound physiological reasoning, for we must suppose that from the primary focus of disease secondary changes take place which lead to the development of epilepsy. The success of this method has not been so great as might have been expected; but it is easy enough to find the explanation for this if we study the morbid changes in the brain underlying chronic epilepsy.

Following upon traumatic injury to the skull or brain, a circumscribed meningo-encephalitis is often engendered, sometimes due directly to the impingement of a spicule of bone, at other times due to hemorrhage occurring at the moment the injury is inflicted. If the hemorrhage has been a very copious one, it may lead later on to the formation of a cyst. This circumscribed meningo-encephalitis may be recognized in some instances without incision of the dura; but in other cases it is revealed only after a microscopical examination of the excised tissue. This has been brought out very distinctly in the articles of Coen[1] and of Van Gieson.[2] The latter has insisted on the occurrence of adhesions between the pia and the cortex, of a chronic degeneration of the pyramidal cells, and of an increase in neuroglia-tissue. Similar conditions have been found in three cases of ours which are to be specially reported upon by Drs. Collins and Wiener.[3] As a point of practical importance it is well to insist that, if the symptoms have pointed to the necessity of an excision of the tissue, such excision should be performed even if at the time of operation the cortical tissue appears to be normal.

The true pathology of partial epilepsy is not exhausted by the study of small portions of the brain excised during an operation. A number of years ago we called attention to the fact that the investigations of

[1] Ziegler's Beiträge zur Path. Anat. u. Phys., 1888, vol. ii. p. 107.
[2] New York Medical Record, April 24, 1893.
[3] To be published in Brain.

Féré, Chaslin, and others prove that a general sclerosis emanating from the focus of disease is apt to be developed in the cortex. If we excise the focus, the sclerosis will still remain, and these sclerosed and degenerated fibres will exert an epileptogenic influence upon other portions of the hemispheres. An interval, varying between several months to two years, elapses before this sclerosis is fully developed, and a similar interval exists between the time of the original injury and the first occurrence of the epilepsy.[1] Such reflections as these justify the excision of the focus of disease before the development of a widespread sclerosis has taken place. Moreover, we can also understand why an excision of tissue many years after the traumatic injury is bound to be of but little avail. Another disadvantage is this: that after the excision of tissue a scar may be developed which may act as an irritant and may produce epileptic seizures.

The method of treating epilepsy by excision of cortical tissue has still another drawback. If the focus of disease is in the motor areas, excision of such tissue will be followed by paralysis. This paralysis is, however, of a transitory nature, not only in children, but also in adults. This was made evident particularly in Case 19, in which we had performed a total excision of the arm-centre in both hemispheres, and yet there was merely a temporary paresis of each upper extremity for a few days after the operation. At present this patient has control over both extremities as before. This experience throws a rather queer light upon the theory of the localization of centres in the cortex. In several of our patients the paralysis after excision lasted so short a time that it could hardly be considered a disadvantage. This disturbance of function, indeed, was so slight that one is compelled to assume that the diseased area had ceded its function to neighboring and healthy portions of the cortex. The probability of this is emphasized by the fact that in two patients operated upon the palsy did not appear until several days after the operation, at a time at which we may suppose that the tissue bordering upon the diseased area had been slightly affected by the surgical procedure. We trust that this observation will be corroborated by others. If the diseased area is situated in one of the sensory portions of the hemispheres, as is not infrequently the case in traumatic epilepsies, hearing or sight may be permanently impaired. The exact result of excision under such circumstances has not yet been determined, for we have not had the courage to practise excision of any sensory portion of the cortex. On physiological grounds, however, it is safe to say that absolute blindness or deafness would not result from the removal of any such area. In the following tables we propose to give the chief points of the histories of the nineteen cases operated upon by Gerster.

[1] These views have been substantiated by the recent work of Muratow (Deutsche Zeitschrift f. Nervenhlk., vol. viii. p. 97). This author has attached special importance to the degeneration of the association-fibres, and insists that the epileptic irritation is conducted by these association-fibres and keeps the neighboring cells in a condition of permanent hypertonia.

Group I.—Cases Cured by Operation.

No.	Name, sex, and age.	Abstract of history.	Interval between trauma or beginning of disease and operation.	Interval between beginning of epilepsy and operation.	Date and character of operation.	Course after operation.	Remarks.
1	O. E. M. 44	Journalist; married 2 yrs. In 1883 made a trip from New York to Philadelphia in a condition of alternating consciousness; did not realize where he was until he reached Philadelphia; otherwise has always been healthy. In May, 1892, fell from a bicycle; was totally unconscious for 4 days, but recovered completely within 10 days. After 8 weeks was able to do his work. No symptoms of paralysis at any time. 6 months after the fall had left-sided convulsions, several attacks each week; since 2 months repeated general convulsions, with loss of consciousness, etc. Painful swelling and scar in the right fronto-parietal region.	1 year.	6 months.	May 26, 1893, trephining and removal of depressed portion of skull; trephine-opening about 4 cm. in diameter. Removal of adhesions between the thickened dura and bone. Brain pulsates; brain aspirated; no cyst found; Trephine-opening not closed.	Made excellent recovery; after 13 days was dismissed from hospital. Had only one very mild spell in Nov. 1893; in May, 1894, had a fainting-attack, without convulsions, after excessive work, but since that time has been absolutely well.	Up to June, 1895, had been taking small doses of tincture of opium, 5 to 10 gtt. at night, but since that time no medicine. In 2, possibly 2½ years, no spell. Patient has written a letter in April, 1896, stating that he is entirely well.
2	O. L. M. 21	Well-developed young man; lost one brother of brain tuberculosis. Father is a trained nurse; boy received a blow on head a couple of years ago. Nov. 29, 1895, he noticed slight twitchings in right thumb, which were followed by a typical epileptic spell. Same day had two additional attacks of same character. The day following several such spells; in some of them the entire hand was convulsed. Well after that until April, 1895; then repeated epileptiform seizures involving the thumb, without loss of consciousness. Has received large doses of bromides (patient of Dr. Collins).	2 yrs.(?)	5⅓ mos.	First operation May 14, 1895, trephining and chiselling of skull to expose the centre for the right hand and arm; area determined by electrical tests. Under ether patient did so poorly that operation had to be abandoned at this point May 20, 1895, second operation; dura opened; excision of the lower half of arm-centre; dura closed; trephine-opening about 3½ cm. in diameter; bone was not replaced.	On May 16th, after the first operation, had three convulsive seizures involving right half of the face and the right arm, with loss of consciousness. On the day after second operation had a slight attack involving eye, right half of nose, and right eyelid; this attack was almost continuous for one hour, but no loss of consciousness; relieved by hypodermic injections of morphia; patient presented anæsthesia of right thumb and of index-finger, and a mild paresis of entire hand. May 26th, paresis had become distinctly	No attacks since May 21, 1895. Received at first 30 gr. of bromide daily. Bromide treatment was continued by Dr. Collins, but is now being gradually lessened. Dysarthria has disappeared entirely. There is no paresis of the right hand. Patient complains slightly of a feeling of formication in the thumb, but there is no anæsthesia. Is actively engaged in business, and is as bright as ever. This case will be described in full by Dr. Collins. Microscopic examination of the excised portions of the cortex by Dr. Wiener revealed an old focus of traumatic origin in the gray substance of the cortex, and the

						less; on May 31st paralysis was vastly improved; first walk June 12th, 21 days after second operation, was dismissed from hospital At that time exhibited slight dysarthria, which continued during the first two months.	remains of an old lepto-meningoencephalitis. On inquiry, Dr. Collins reports that patient has had no attacks up to Sept. 1896.
3	J. B. M. 8	At the age of 7 months some traumatic injury. Feb 1891, epileptic attacks with sensory auræ (either the sound of an engine or a foul odor). For some time has had otitis media. If ear ceased discharging, had several attacks each day. Left mastoid process very painful.	At least 7 years; doubtful whether traumatic injury is the cause of the ear trouble. Several years have elapsed since the beginning of otitis.	6 months.	First operation Aug. 14, 1891; left mastoid process opened up, two pieces of bone removed Second operation Nov. 17, 1891; mastoid process opened again; silver canula introduced to secure permanent drainage.	Paralysis of left facial; on Sept. 10 first attack. After that repeated attacks as before operation. The day after the operation convulsions of right half of body; since that time no attacks.	The mother states, April, 1895, 3½ years after the second operation, that the boy has had no attacks since—is absolutely well.

Group II.—Cases Improved, but not Cured by Operation.

4	T. C. M. 44	At the age of 11½ yrs. was severely kicked by a man on the right side of occiput; 6 months later first epileptic attacks, which were repeated; at first petit mal, later on grand mal. In first year 2 to 3 attacks, then at least one every 6 wks., but always during the night. No paralysis; no hemianopsia; distinct depression in occipital region. While patient was under observation was entirely free from attacks for a period of 8 weeks; attacks then returned.	14½ yrs.	14 years.	First operation May 29, 1891. Trephining and chiselling over depressed portion in right occipital region. Opening made about 3 cm. in diameter Enormous exostosis of skull, almost doubling underlying brain.	On November 22d, short spells, but no others for a period of 3 weeks, while in hospital. Went West and reported at first that attacks recurred about every six weeks, but after two years sent a letter stating that attacks were lighter and occurred only at intervals of three months.	Attacks have returned, but they are stated to be mild and somewhat rarer. Memory is normal. Is able to do work. Patient is of the opinion that he is very much better than before the operation. Last account received in autumn of 1893.
5	E. S. M. 12	In the spring of 1890 was run over by a wagon, and sustained severe injury over occipital region; unconscious for 10 days and had convulsions during this time. For a period of one year no convulsions, then seizures became frequent and regular, as many as 1 to 6 per day. Painful scar in left occipital region near the median line. No depression could be felt.	2 years.	About 1 year.	First operation May 27th; trephining and chiselling over occipital region, an opening made about 3 cm. in diameter. Bone was not replaced.	Patient recovered rapidly; in the first year only one attack coming on after severe emotional excitement. For two years no seizures. During the intense heat of April, 1896, after a hard day's work in the garret of a factory, had a slight spell. Another slight spell in July, 1896.	Decided improvement; only three spells in four years. Complete recovery still possible. Boy is able to earn his own living. (We are indebted for this report to Dr. Stieglitz, who brought the patient to us.)

No.	Name, sex, and age.	Abstract of history.	Interval between trauma or beginning of disease and operation.	Interval between beginning of epilepsy and operation.	Date and character of operation.	Course after operation.	Remarks.
6	K. A. M. 9	At the age of 5 years had a "congestive chill" and spasms. No paralysis. Two or three years later developed Jacksonian epilepsy, beginning in the left hand, without loss of consciousness. No evidence of palsy. Boy feels left hand drawn up during the spell.	4 years.	1 to 2 yrs.	Operation April 12, 1892; trephining and excision of hand-centre in right hemisphere.	Hand was paretic for a few days only. Rapid recovery during six weeks in the hospital, no attacks; but as soon as he left hospital and ran about during hot weather had a severe attack with loss of consciousness and involuntary passage of urine. A number of such seizures during the next three months.	Improvement at first after operation, but recurrence of the attacks in consequence of insufficient care. In the later attacks right arm was also involved.
7	J. C. M. 25	A printer, strong drinker and smoker. 5 years previous to operation a severe epileptic seizure; in the spring of 1891 an injury to skull, probably during state of intoxication. This was followed by epileptic attacks which became more and more frequent. Since March, 1893, one seizure every two weeks. The convulsions begin in right hand followed by loss of consciousness. Large scar in right frontal region.	At least 2 years and 9 months. 1 epileptic seizure 5 years previously.	About 2½ years.	Operation Dec. 12, 1893; trephining over the arm-centre in the left hemisphere. Inner table adherent to dura At this point dura aspirated, no fluid withdrawn. Brain pulsates equally. A second trephine-opening was made in the frontal region over the scar Inner table separated from rest of skull; no fluid withdrawn by aspiration.	Recovered satisfactorily; but slight paresis of the right upper extremities and of the right facial, also distinct dysarthria. All these symptoms disappeared in the course of a month. Jan. 12, 1894, a mild attack, but no others until Feb. 8, 1894, when patient was dismissed from the hospital; since that time no report.	Improvement after operation more than was to be expected in the case of a man addicted to alcohol. Later report not obtainable; for that reason it is impossible to say whether improvement has continued.
8	L. C. M. 6	Said to have had brain fever at age of 10 months. At 5½ years first right-sided convulsions reported at intervals of one week. Right hemiparesis since first attack, athetoid and associated movements.	5 years, but doubtful whether the cerebral disease at the age of 10 months was the direct cause.	6 months.	Operation Dec. 29, 1890, exposure by chiselling of motor area of right arm, determined by faradization. Dura adherent and tense. No cyst found on puncture.	Recovery excellent; no convulsions up to Feb. 2, 1891, when boy was discharged from hospital. One attack since leaving hospital.	In the spring of 1896 we were able to obtain further information regarding this boy. He is now in an institution for feeble-minded children in Vineland, N. J. Dr. Corson reports that he has had a number of attacks from February to May, 1891, but that for a period of four years, until Aug. 1895, he had not a single attack. Since that time occasional seizures have occurred. The athetosis still exists, but the hemiparesis is very slight. We may therefore state that there was a complete remission lasting four years. The probability of a cyst very great. Another operation indicated.

Group III.—Cases Unimproved by Operation.

9	W. H. M. 20	At the age of 12 years was pushed back over pole of wagon, supposed to have struck back of head(?). Unconscious for a few minutes, but continued work as usual; one week later general epileptic convulsions. Has petit mal, and above all Jacksonian epilepsy involving muscles around right half of mouth. Occasionally eyes are involved. Attacks very frequent, but as a rule no loss of consciousness in them.	8 years.	8 years.	Operation Feb. 13, 1891. Exposed centre representing right angle of mouth according to Horsley, determined by electrical stimulation. No excision. Adhesions under the button of bone; small cysts on dura. On puncture a little bloody fluid withdrawn; large opening (4 cm.); bone not replaced.	The recovery rapid after operation, but no diminution of attacks.	No improvement. We hesitated at the time to perform excision. In all probability this would have done little good.
10	M. K. M. 16	At age of 18 months fell out of window, since that time epileptic attacks at varying intervals. Has had enormous doses of bromides given him by a number of physicians. Is ill-tempered and stupid. Bromides were stopped. No attack for three weeks, then left-sided convulsions becoming general.	14½ yrs.	14 years	Operation Feb. 23, 1891. Large trephine-opening over motor area for arm and leg in right hemisphere.	Good recovery, but no diminution in the number of attacks.	Old case. Operation done at the bidding of father.
11	E. L. M. 30	Traumatic injury of right occipital region. General convulsions.	All data uncertain.		Operation July 24, 1892, trephining over right occipital depression; adhesions between dura and skull. No excision.	Made good recovery, but developed delusions of persecution. Attacks returned after two weeks.	No improvement. Alcoholic case.
12	H L. M. 24	Six years previously fell, striking right(?) occiput. One yr. later first seizure affecting right arm and leg. As many as 6 attacks per day, at present only 3 or 4 in two weeks.	6 years.	5 years.	Operation Jan. 29, 1892, trephining over arm-centre, left hemisphere. Dura opened. Second operation March 8, 1892, excision of the entire arm-centre (electrical test).	Repeated attacks after both operations.	No improvement in spite of excision; slight paresis of the right arm coming on 2 days after excision. Paresis recovered from in the course of 2 weeks.
13	C. D. F. 9	Fell out of window at six months, striking head against bare floor. At 10 months a tedious illness, slow in development. At age of 5 years began to have innumerable convulsions (at least 50 per day); idiocy.	8½ yrs.	4 years, possibly longer.	Operation Feb. 15, 1892, large trephine-opening over the arm-centre of left hemisphere.	Rapid recovery. Attacks somewhat less.	No improvement. Operation done at the request of parents.
14	K. F. F. 20	Since the age of 13 months epileptic convulsions generally beginning in the right hand, then involving the right arm and right leg. History otherwise very uncertain. Three years ago patient was operated upon by another surgeon, who trephined over the right half of the skull.	19 years.	19 years.	Operation Jan. 30, 1894. The entire arm-centre in the left hemisphere was exposed by trephining, a number of punctures were made, but no cyst found. Dura opened; cortex appeared to be normal. Excision was not done because probability of recovery seemed altogether too slight.	Recovered rapidly; after two weeks, attacks were fully as frequent as before.	Patient is still under observation. There is no improvement whatever, although there has been a trephining operation done over both arm-centres.

No.	Name, sex, and age.	Abstract of history.	Interval between trauma or beginning of disease and operation.	Interval between beginning of epilepsy and operation.	Date and character of operation.	Course after operation.	Remarks.
15	H. P. M. 17	First examination Jan. 15, 1893. At some time in early childhood patient was struck on the head by an iron instrument in the hands of a stepmother. No spasms during dentition. No hereditary tendency to epilepsy. First attack at the age of 11 years; had general epileptic convulsions at that time. On examining the right parietal frontal region it was found to be painful on percussion; patient also refers to this region as the site of intense headaches. The father stated that the convulsions often begin in the left hand, but such seizures could not be observed in the hospital.	At least 10 years.	6 years.	First operation Feb. 14, 1893. Trephining over arm-centre in left hemisphere. Mar. 22, 1893, a second operation. Trephining over the arm-centre in the right hemisphere. No excision.	Recovery from operation prompt. A few attacks in the second to fourth weeks. For two months after the second operation no attacks, but from that time on the same returned and have been quite as frequent as before; the headaches, however, were not so severe.	No improvement in epilepsy, but father and son insisted upon a third operation Attempt made to lessen tension caused by dense scar at site of first operation on left side. Third operation March 16, 1896. Cutting through scar at site of first operation, the surgeon found an enormously thickened membrane between dura and scalp. In attempting to separate adhesions and cutting through thickened membrane, excessive hemorrhage occurred which it was impossible to check for some time. Patient did not recover from shock of operation, and died in a condition of collapse three days after operation.
16	A. S. M. 14	At age of one year had an epileptic seizure following diphtheritic laryngitis. Subsequently left hemiplegia. Three years later left-sided convulsions, at first once a week, gradually becoming more frequent. For at least a year before operation, epileptic spells daily. Examination showed left hemiparesis. Had learned to talk with difficulty, beginning to utter a few words at age of 2 years. Imbecile.	13 years.	10 years.	Operation: Trephining over arm-centre in right hemisphere, excision of entire centre. Microscopical examination revealed an old hemorrhagic meningo-encephalitis. (See Fig. 145, Sachs, Nervous Diseases of Children.)	Recovered rapidly, but no distinct improvement after the operation. Only during first three days were attacks inhibited; on second day after operation left arm and left hand appeared more palsied; after three weeks arm and hand were in about same condition as before operation.	No improvement, but it may be noted that the palsy was not made permanently worse by the excision of tissue. According to report received several months after the operation no improvement whatever was noticeable
17	T. D. M. 16	Right hemiplegia since early childhood. At the age of 3 years the first epileptic seizures, which gradually became more intense and more frequent.	14 yrs. (?)	13 years.	Operation March 21, 1893. Bone flap formed over motor centre in left hemisphere. No pulsation of dura. After opening, dura was punctured revealing presence of a large cyst, size of which could not then be suspected, but it evidently had undermined almost entire hemisphere. Electrical stimulation of motor centres gave satisfactory responses. Gradual drainage of cyst.	Patient made a poor recovery. Serous fluid kept oozing away continuously. The patient went by degrees into a condition of coma and died May 9, 1893.	The size of the cyst could not be suspected; in such a case permanent drainage should of course not be attempted; trephining alone must suffice.

18	B. J. B. M. 34	Letter-carrier. In Dec. 1888, was thrown from a wagon striking occiput; was unconscious for 15 minutes. After the fall felt fairly well with the exception of severe headaches now and then. Five months after the accident first epileptic seizure during sleep; seizures were nocturnal, for a long time once a week. In the year preceding operation has had two or three attacks per week at different times of day. No hemianopsia; no sensory auræ. Painful scar over the right occipital region.	4½ yrs.	4 years.	Operation July 18, 1893. A large flap was formed in right parieto-occipital region, including the old scar. No external depression of skull; trephining; dura thickened and very hyperæmic. Puncture negative. No excision. Dura not opened.	Had no attacks up to July 30. In the absence of surgeon further treatment was left in the hands of an assistant, who appears to have been careless in changing dressings. All the symptoms of a septic meningitis appeared, with high temperature and coma. Died Aug. 3, 1893.	Greater care in the after-treatment of this case would have prevented the sad outcome. The operation itself was in nowise to blame for the death.
19	F. L. M. 15	Until the age of three years was mentally and physically sound. When about 3½ years fell from a chair striking the back of head(?). At the age of 4½ years had first attack of petit mal, soon thereafter a distinct attack with convulsions; the head always turned to the right, the right hand and the right leg being convulsed first, and then the convulsions would become general; loss of consciousness in nearly every attack. The seizures have become more frequent, often 4 or 5 a day. In the hospital a number of seizures were observed, but they bore the character of general convulsions. Patient is feeble-minded.	12 years.	11 years.	First operation Feb. 11, 1896. Bone-flap formed over arm-centre in the left hemisphere, excision of the centre. Second operation May 13, 1896, similar to first operation, but excision of the arm-centre in right hemisphere. In both operations the motor areas were determined electrically; the bone was replaced.	Patient recovered rapidly, but attacks returned 12 hours after operation in spite of large doses of bromide and chloral. He had two or three general convulsions daily. Recovery rapid; no diminution in attacks.	Patient was operated upon at request of parents. It is evident that excision of both motor arm-centres was of no avail. It is interesting to observe that in this case after each operation the extremity corresponding to excised centre was only slightly paretic for 48 hours; after that patient was as well able to move these parts as before. Sensory tests could not be made satisfactorily on account of mental condition of patient. April 20, 1896, he was dismissed from hospital as "unimproved." Examination of excised piece of cortex revealed degeneration of the pyramidal cells and thickening of neuroglia. A full report is to be made by Dr. Wiener.

If we compare the various groups of cases, we are struck at once by the fact that among the cases which have been cured there are two in which only a relatively short time had elapsed between the traumatic injury and the operation. Furthermore, that in one case only six months had passed between the beginning of the epilepsy and the preceding traumatic injury to the skull. In the other, a period of about two years.[1] In Case 3 it is a little doubtful whether the traumatic injury can be held responsible for the development of the epilepsy. We incline rather to the view that the ear trouble was developed independently of the preceding trauma. In the second group we note that a more considerable period of time had elapsed between the injury or the beginning of the disease and the operation. In those cases of this group in which the period of time was a relatively short one, and yet complete recovery did not set in, the failure can be attributed to other causes. In Case 5 the improvement was very remarkable, for only three attacks had occurred in four years; but the boy is compelled to do hard work, and it is fair to predict that if he had been able to take better care of himself he would have recovered completely. The same is true of Case 6, while in Case 7 the abuse of alcohol is to be considered the chief reason for the poor result obtained. The importance of careful treatment for a long time after an operation is well demonstrated in Case 8. In all of the cases in Group III. the operation was not undertaken until many years had passed after the initial trauma and after the beginning of the epilepsy. We may infer from this that the prospect of curing epilepsy is a gloomy one if many years have elapsed since the disease has manifested itself; and if a long period of time has elapsed, it matters little whether we resort to trephining or excision, for all operative procedures will prove equally unavailing.

Returning to the consideration of Case I., we may note that it was sufficient to remove the depressed portions of bone and to expose a considerable area around the old scar to effect a cure of the epilepsy. The result in this case is all the more remarkable because the patient had revealed a distinct tendency to alternating conditions of consciousness—a condition which we know to be common in genuine epilepsy. Such predisposition would unquestionably make the prognosis less favorable in the majority of cases, and yet the good results obtained in this instance prove that even under such circumstances one need not desist from operative procedures if the patient's general constitution and the character of the skull-injury warrant surgical interference. This same patient—a man of great intelligence—sent a letter only a few months

[1] The importance of the time-element in these cases does not seem to have been appreciated by the latest authors on this subject—Broca and Maubrac.

ago in which he stated that he considered himself completely cured by the operation. In the second case, for which we are indebted to Dr. Collins, the wisdom of early surgical interference is very apparent, for the microscopical examination of the excised portion of the cortex has shown that the disease was due to a well-circumscribed focus of traumatic origin, which would surely in the course of time have given rise to a widespread degeneration of the association-fibres, as Muratow has lately explained. Case 3 proves that any irritating condition, such as an otitis media, may give rise to chronic epilepsy. In this instance two operations were needed to bring about a satisfactory result. In a previous article we have spoken of the result in this case in a rather reserved fashion, for six months only had passed since the operation and the time of the first report; but the mother of this boy has made further reports, and we can now claim that the boy has been cured, for the mother reported, three and a half years after the operation, that the boy had not had a single attack. It will not be necessary to discuss in detail each one of the cases reported in Groups II. and III. The reader is referred to the tables, which have been carefully prepared, and we trust that he will find it worth his while to note the points of resemblance between the more or less successful and the totally unsuccessful cases. If we were to attempt to give a purely statistical statement, we might say that *of the nineteen cases here reported three were cured, two greatly improved, three somewhat improved; while in eleven cases there was absolutely no improvement.* These last eleven cases are equally valuable, however, in showing that partial epilepsies which have existed for a long number of years cannot be cured or improved by any operative procedure.

If we attempt to decide which surgical procedure would seem to be best adapted to effect a cure of partial epilepsies, the answer is that no one method would seem to be superior to all the others. If there is depression of the skull or any other traumatic injury of the same, trephining alone will, as a matter of course, prove beneficial. If there is a thickening of the membranes and adhesions, as is so frequently the case in the wake of traumatic injuries, the removal of such diseased tissue is in order. If there is any morbid process, such as in our Case 3, which is the main cause of the epilepsy, the attempt should be made to cure the primary disease in the usual way. If the symptoms point to a strictly localized focus of disease in the cortex, whether or not there be a complicating injury to the skull, it is advisable to excise the diseased area, particularly if a relatively short period of time has elapsed since the injury was inflicted. The result in Case 2 is the strongest argument in favor of this procedure.

A number of years ago we had referred to this as the only rational method in the surgical treatment of epilepsy, and this opinion has been

strengthened by our own experiences and by a few of the cases recorded in literature. A satisfactory result has been obtained in this way by Horsley (*British Medical Journal*, August, 1886, p. 674) in several cases, and in at least one case the attacks have not returned for a period of one year. Several other reports of Horsley are open to the serious objection that the report was made altogether too early after the operation. The same criticism is to be made upon the case recorded by Beach (*Boston Medical and Surgical Journal*, April 3, 1890). An improvement, though not a complete cure, was obtained by the method of excision in the case of Bergmann (*Die Chirurgische Behandlung der Hirnkrankheiten*, etc., second edition, p. 169, Berlin, 1889), in the case of Parker and Gotch (*British Medical Journal*, London, May 27, 1893), and in a case of Bidwell and Sherrington (*British Medical Journal*, November 4, 1893). In all of these cases, and in some of our own in which merely an improvement was noted, the lapse of time between the initial injury or beginning of disease and the time of the operation is altogether too great. The only exception to this is in the case of Parker and Gotch; but here it is a little doubtful whether the correct centre was excised. For the purpose of giving this method a fair test we have performed excision of cortical tissue upon a number of different patients (Cases 2, 6, 12, 16, and 19). Our experience in these cases leads to the conclusion that in epilepsy of long standing the excision of cortical tissue does no good; and such excision is hereafter to be restricted to epilepsies of short duration. In our first article on this subject we were inclined to take a less favorable view of this method; but at that time we had not yet perceived the importance of recognizing the length of time the epilepsy had lasted.

The neurologist is asked to decide whether the site for the operation shall be determined according to the seat of the external injury or whether it shall be determined entirely by the clinical symptoms if both do not happen to coincide with each other. In answering this question we would urge that the clinical symptoms are far more reliable than any external injury. If the two areas are distinct, it may be well in some instances to trephine over both; but excision should only be performed in that part of the cortex to which the symptoms point, unless the cortical tissue underneath the seat of external injury is clearly diseased.

The greatest care is also necessary in determining the region which the clinical symptoms indicate to be the diseased area. The ordinary methods of determining these areas that have been devised by Reid Thane, Hammond, and others, are satisfactory enough; but it is essential, whenever possible, to determine the function of the exposed part by electrical stimulation, and this can be done readily, as we have

shown, before the dura is opened. If the site has been properly located, electrical stimulation of the exposed tissue will cause contraction of the part first convulsed in the epileptic seizures with which the patient is afflicted. Occasionally it will be possible to produce a slight convulsive seizure during the operation; but this cannot be produced in every instance unless excessively high currents are employed. In Case 9 the accuracy of such determination was brought out most distinctly.

A further duty devolving more particularly upon the surgeon is to determine the means by which the formation of tense scars may be avoided. In Case 15 we discovered at the time of the third operation, which was undertaken fully two and a half years after the first one, that the trephine-opening was filled by a mass of dense tissue which had surely increased the local pressure, and had thus undone any good effect that might have been expected from the removal of a large button of bone. Such dense tissue is possibly worse than slight adhesions and a moderately depressed spicule of bone. The scar appears to become more tense in those cases in which the bone is not replaced, and in several patients of ours we have observed years after the trephine-opening had been made that the pulsations in the brain could not be noticed or felt. The only method known to us at the present time to avoid the formation of these scars is the introduction of some pliable metal plate between the dura and the skull. Gerster made use of this method in an operation done upon a patient of Stieglitz for the removal of a cerebral cyst. Two years and nine months after the first operation upon this patient a second operation became necessary, and at this second operation it was made evident that the gold plate lay exactly as it was introduced—that the surrounding tissue had undergone fewer changes than would have been the case if the ordinary scar had formed. If these operations for epilepsy are to be successful, a serious attempt must be made to avoid the formation of dense scar-tissue; and it is possible that the heteroplastic closure of the skull-opening will contribute somewhat to the avoidance of excessive scar-formation. At all events, the evils attendant upon the development of scar-tissue must be mitigated in some way or other, and it will not do to regard it as an unavoidable complication in all cerebral operations, as is done by Starr.[1]

Before concluding this report a few remarks will be in order regarding the cases of epilepsy associated with infantile cerebral palsies. In various previous writings one of us (Sachs) had called attention to the fact that such palsies are amenable to surgical treatment for the very reason that cystic conditions or old hemorrhagic foci often constitute the

[1] Brain Surgery, p. 112.

anatomical substratum both of the epilepsy and of the palsy. Cases 6, 8, 16, 17, and possibly Case 14 belong to this category. In none of these have we achieved an absolute cure, yet the improvement in Case 8 has been most decided. The failure to obtain a cure in these cases is explained easily enough. Above all, it is true that these cases in particular are not brought to the notice of neurologists until years have elapsed after the beginning of disease; but even if they came under observation at a much earlier period, we should have some hesitation in advising operation, for we know that children under the age of six years tolerate poorly almost every form of cerebral or cranial operation. The sad result in Case 17 suggests the possibility of finding in these infantile cases cysts of enormous size, possibly underlying the entire hemispheres. The drainage of such cysts is a very delicate matter, and yet the experience of Kocher and others in the treatment of large cysts would lead us to believe that by the exercise of the greatest care some of these patients may be vastly improved, if not absolutely cured. All of these difficulties can be met, and we confidently believe that cases will occur in which the removal of a well-limited focus of disease will prove beneficial. Physicians and patients should be imbued with the idea that, other things being equal, the earlier operative interference is attempted, the more successful it is bound to be. The excision of diseased cortical tissue or the drainage, if not the removal of an old cyst, will cause comparatively little additional disturbance of function, for the parts governed by the diseased centres are, as a rule, considerably palsied. The epilepsy may be improved, the palsy can hardly be made worse by the operation.[1]

From the preceding discussion we may draw the following conclusions:

1. Surgical interference is advisable in those cases of partial epilepsy in which not more than one, or at the utmost two years, have elapsed since the traumatic injury or the beginning of the disease which has given rise to the convulsive seizures.

2. In cases of depression or other injury of the skull surgical interference is warranted even though a number of years have elapsed; but the prospect of recovery is brighter the shorter the period of time since the injury.

3. Simple trephining may prove sufficient in a number of cases, and

[1] Operations for the removal or cure of epilepsy associated with infantile cerebral palsies have been done by Oppenheim and Sonnenburg (Berlin. klinisch. Woch., 1892, p. 60), by Bullard (Boston Medical Journal, February, 1888), by Keen (THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, September, 1891), by Wildermuth (Neurolog. Centralbl., 1891, p. 935), by Wyeth (two cases with Sachs), Horsley (British Medical Journal, 1890, vol. iii. p. 1291), and others. It may be well to add that in some of these infantile cerebral palsies with epilepsy there is a marked atrophy of part of the cerebral hemispheres. The excision of atrophic tissue or of a porencephalic area, as has been practised by some, is not rational.

particularly in those in which there is an injury to the skull or in which a cystic condition is the main cause of the epilepsy.

4. Excision of cortical tissue is advisable if the epilepsy has lasted but a short time, and if the symptoms point to a strictly circumscribed focus of disease.

5. Since such cortical lesions are often of a microscopical character, excision should be practised even if the tissue appears to be perfectly normal at the time of operation; but the greatest caution should be exercised in order to make sure that the proper area is removed.

6. Surgical interference for the cure of epilepsy associated with infantile cerebral palsies may be attempted, particularly if too long an interval has not elapsed since the beginning of the palsy.

7. In cases of epilepsy of long standing, in which there is in all probability a widespread degeneration of the association-fibres, every surgical procedure is useless.

SOME ABNORMALITIES OF THE FEMALE GENERATIVE ORGANS.

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It is most important that abnormalities occurring in the human subject should be recorded and their relation to developmental anatomy studied. This is especially true of the many interesting examples of so-called malformation affecting the female genitalia. By this means additional links may be added to the complex chain of development. To make this subject sufficiently clear it will be necessary to describe the steps in the formation of the internal and external organs of generation. Cases observed personally will be added and their relation to fœtal anatomy detailed.

Those who have studied this subject must have noticed that a so-called malformation is, in reality, a non-formation of one part involving a relative disproportion. Malformations represent stages of development which have remained permanent. Before an organ has reached the mature, or, as we term it, the fully developed state, we are enabled to distinguish two processes at work, viz., development and growth. The period of development in the uterus extends up to the time of puberty, the period of growth is much longer, probably lasting until the twentieth year.

In the human female the vagina, uterus, and Fallopian tubes are formed out of the Müllerian ducts. The portions of those ducts which become

fused are developed into the vagina, cervix, and part of the body of the uterus. The next following portions of the Müllerian ducts constitute in animals with bicornuate uteri the horns of the uterus. In the human female these portions of the ducts remain comparatively short, entering into the formation of the upper part of the uterus. The remaining upper portions of the ducts of Müller form the Fallopian tubes.

The presence of a two-horned uterus, the normal condition in many animals, occurs in the human embryo of the third month. The subsequent median fusion and consolidation of these horns form the triangular body of the human uterus. Again, there is no distinction in the human fœtus at the third month between the vagina and the uterus, which is also seen in many animals. At a later period the os uteri begins to form, and gradually a distinct neck (cervix) can be seen. Thickening in the walls occurs first in the cervix, which up to the time of birth is much larger and thicker than the body of the uterus. It will be seen that there is a close relationship between fœtal anatomy, comparative anatomy, and abnormalities in the anatomy of the female genitalia.

External Generative Organs. There is no distinction of sex in the human embryo up to a certain period of development. In both sexes the structures distinguishing the male and the female externally arise respectively from common masses of blastema of precisely similar structure and connections.

The common cloaca exists till after the fifth week, and the genital eminence from which the clitoris is formed makes its appearance in the course of the fifth and sixth weeks in front of and within the common orifice. A week or two later the common orifice becomes divided, the precise method of division not being definitely ascertained. The cloaca is thus separated into a dorsal or anal and a ventral or uro-genital part. A transverse band of integument appearing at the ninth or tenth week completes the division between the anal and urogenital orifices, forming the so-called perineum in the female. The urogenital portion contracts in its upper part to form the urethra, whilst the lower part persists as the vestibule. The labia minora are developed from the margins of the genital cleft.

This short outline will suffice to explain the main points in the development of the internal and external generative organs. We have now to study the bearing of developmental anatomy on certain abnormalities of the genitalia in the human female. For this purpose I shall narrate the cases which have come under my own observation and briefly refer to some of those already described in the literature on the subject.

Case I.—A. L., aged thirty-one years; married, sterile. Complaint: swelling in the left groin, "Ever since she can remember." Patient had a masculine appearance, hair on upper lip and chin, and hair extending from pubes upward along the linea alba to the umbilicus. Her voice

was not of a masculine character. She was very nervous. The swelling in the groin was stated to enlarge and become more tender during the menstrual periods—which are regular. Pressure on this swelling caused a sickening pain.

Examination of genitalia. The breasts are badly developed. The external genitals showed nothing abnormal. The vagina proper ends in a cul-de-sac one and one-half inches long, with a small aperture, the os uteri, at the upper end. The recto-vaginal septum is incomplete at the lower end, and feces are passed through the vagina.

She has control over the bowel unless diarrhœa be present. No sphincter is appreciable to the finger. The anus proper is the size of a No. 6 catheter, and a probe passed through it can be felt by the finger introduced into the vagina.

The uterus, which measures about one and one quarter inches, may be felt bimanually.

An operation for the radical cure of the hernia was carried out by Mr. Keetley at the West London Hospital, to whom I am indebted for the following notes: When incised the sac contained the ovary, Fallopian tube, and a portion of the uterus. The sac was thin-walled and had no true neck. The operation was a complete success.

Case II.—A. W., aged twenty-one years. Complaint: amenorrhœa. She had no male characteristics. Since the age of fourteen years for two or three days every month has had headache, backache, and bearing-down pains. A swelling has appeared in the left inguinal region at intervals for "some time." She states that occasionally the pains are so severe that she becomes faint and is prevented from working. Her pains have increased since she sought medical advice. Removal of the ovaries had been advised by a former medical attendant. These pains have been worse since straining herself while drawing water five years ago.

Examination of genitalia. Complete absence of pubic hair; clitoris rudimentary. The vagina, about one inch in length, forms a cul de sac, at the upper end of which a small papilla is noted corresponding to the usual position of the os uteri. Bimanually (recto-abdominal)[1] no uterus, tubes, or ovaries can be felt. In the position of the uterus a broad band is found extending from one side of the pelvis to the other, midway between the bladder and the rectum.

The breasts were well developed and the nipples normal.

While an undergraduate at Edinburgh University I saw the following case, which is described in the *Edinburgh Medical Journal*, xxxii. 734.

M. M., aged twenty-one years. Had absence of left ninth rib and slight lateral dorsal curvature. When the patient coughed a large hernial protrusion was observed between the eighth and tenth ribs, especially posteriorly. Her complaint was absence of menstruation.

Examination. Mammæ well developed, with large nipples. Dense imperforate hymen. Entire absence of all uterine organs and vagina. Bladder and rectum normal. Pubic hair normally developed. This woman was well developed and had no apparent evidence of retarded development.

[1] Such cases are best examined per rectum combined with a sound in the bladder.

In addition to these cases I have seen:

1. A case in which there was an orifice at the upper part of the vagina in the position of the os uteri admitting the tip of a sound. Here the uterus was represented by a cord-like structure occupying the centre of a broad band similar to that described in Case II.
2. Another case in which the uterine probe penetrated half an inch into a spindle-shaped body, the representative of the uterus.

Most authors describe cases of absence of the uterus as being very rare. I am inclined to think that such an abnormality is commoner than is supposed, in spite of the small number of published cases, especially in England. The following cases may be mentioned as bearing more particularly on the subject of absence of the uterus:

1. Leopold (*Archiv. f. Gyn.*, Band 8, p. 484). Patient was slender; habits and inclinations purely feminine. Mons veneris prominent, owing to a testicle and epididymis on either side, each with its vas deferens returning into the pelvis (!). (No post-mortem was obtained.) Normal vagina, no uterus or ovaries. Pelvis normal; roomy, broad outlet. (In this paper reference is made to three previous papers.)
2. Kahn (*Centralblatt f. Gyn.*, xi. 377). Patient aged twenty-one years. Breasts medium size, no axillary hair. No hair on mons veneris; a few hairs on labia majora. Clitoris, præputium, and urethra normal. Vagina 6 to 8 cm. long. Double hernia. No orifice at end of vagina.
3. Grechen (*Centralblatt f. Gyn.*, xi. p. 493). Patient aged twenty-seven years. Had since seventeen very severe hypogastric and sacral pains. Breasts and pelvis well developed. External genitals normal. Vagina 7 to 9 cm. long, ending blindly. Uterus absent. Ovaries said to be in a normal position. Removal of ovaries advised.
4. Mundé[1] (*Centralblatt f. Gyn.*, xi. p. 670). Patient aged forty-six years. Had never menstruated. She was well developed. Breasts well formed. External genitals normal. Clitoris not enlarged. Urethra normal. Double inguinal hernia. Hymen normal. Vagina 8 cm. long, normal dimensions, ending blindly; no trace of portio or external os. Had a rounded body in each labium majus, character not ascertained, supposed to be testicles.
5. Steinschneider (*Centralblatt f. Gyn.*, xii. 49). Patient aged twenty-eight years, married. Breasts not well developed. External genitals normal, clitoris small. Vagina 8 cm. long. No uterus or ovaries.
6. Zweifel (*Centralblatt f. Gyn.*, p. 474). Patient shown at the Leipzig Obstetrical Society. Aged twenty two years. No beard. Breasts well developed. A little hair on mons veneris. Absence of axillary hair. Double inguinal hernia. Vulva normal. Vagina 9 cm. long, ending blindly, no trace of portio. Careful examination showed the presence of a radiating cicatrix without any opening even to the finest sound. Bimanually, a body, like a hazelnut, was found in the position of the uterus, and two rudimentary uterine horns passing to normal ovaries.

Two other cases were shown:

a. Atresia of the vagina, with a rudimentary uterus.

[1] This case is described in a paper by Swasey, American Journal of Obstetrics, vol. xiv. 1881, p. 94.

b. Absence of vagina; dilated urethra. At the top of the bladder a rudimentary uterus could be felt with tubes and ovaries. Double hernia.

7. Flothmann (*Archiv. f. Gyn.*, xxxiii. p. 312). Patient aged twenty-four years, married. Breasts well developed. Urethra widely dilated, allowing the passage of the finger. "Mässige Ausbuchtung" under the very wide urethra. Uterus spindle-shaped. No incontinence of urine, although the urethra was very wide.

8. Rheinstädter (*Archiv. f. Gyn.*, xiv. p. 497). *a*. Aged twenty-two years. Female habitus, female voice, well-developed breasts, pelvis female type. Absence of menstruation. Under anæsthesia the vagina, uterus, and ovaries found to be absent. The external genitals well formed. Bimanually, a body taken to be a rudimentary uterine horn was said to have been detected.

b. Aged twenty-seven years. Had male characteristics—hair on chin and lips, male voice. No breasts; triangular distribution of pubic hair. Clitoris 5 cm. long. Uterus and vagina form a single continuous muscular canal exhibiting annular folds of its mucous lining. With care the index-finger could be passed to the extremity of this canal. No ovaries or testicles could be discovered. The labia flabby; the nymphæ absent. The urethral opening is 1 cm. over the first folds of the utero-vaginal canal, which probably represents the hymen.

9. Rheinstädter (*Centralblatt f. Gyn.*, No. 23, p. 345). Absence of uterus; abnormally wide vagina. In addition there was a herniated ovarian tumor, described as an "angiosarcoma."

An interesting case of what is termed partial defect of the uterus is described and figured by Winckel in his *Lehrbuch der Frauen-Krankheiten*, p. 292 (Zweite Auflage). The uterus had no portio vaginalis and was supposed to commence from the point where the posterior columna of the vagina ended. The tubes, ovaries, and adnexa were absent. No adhesions were present in the neighborhood of the uterus. The specimen was obtained from a fœtus at about the eighth month.

In the *London Obstetrical Society Transactions*, vol. xxi. p. 256, will be found an important communication by Dr. Chambers, in which the previous literature of ovarian hernia is given and a case of great interest fully described. Patient aged twenty-four years. Voice feminine. Breasts well formed; nipples absent, their site being marked by a circular rose-colored spot the size of a threepenny piece. In each groin there was a swelling whose nature was accurately determined after operation. No hair on pubis. Mons veneris not conspicuous. Clitoris small, well formed. Nymphæ rudimentary; vagina smooth, cone-shaped, about one inch long, ending in a cul-de-sac. In the roof of this cul-de-sac there was a triangular opening-apex upward and forward, large enough to admit tip of index-finger. This opening was the meatus urinarius. There was no trace of os uteri, cervix, or uterus. Pelvis was large, well formed, and of the female type. A committee of the Society having examined the tumors removed, reported that microscopically they resembled fœtal testicles, although the stroma was in greater abundance. The great and permanent value of such a case lies in the fact that the swellings were removed and microscopically examined, for by this means alone can the nature of such cases be decided.

We have now to compare these abnormalities in the human female with the ascertained facts of development.

It must be recollected that no *definite opinion* as to the absence of the uterus, ovaries, etc., can be given unless a post-mortem examination has been made or an abdominal operation performed. At the same time opinions formed after careful bimanual examination furnish fairly conclusive proof of the presence or absence of the various pelvic organs.

Ovaries. In the foregoing cases the presence of ovaries has been noted even where the uterus was absent and vagina, etc., imperfectly formed. Such an occurrence should be expected from our developmental knowledge, as the ovaries have a distinct origin apart from the uterus and tubes. Most authorities are agreed that the ovaries arise from formative blastema, situated on the mesial side of the Wolffian body.

In males the testicles arise in a similar situation, so that in the early human embryo there is no sexual distinction in the internal generative organs until the seventh week, becoming more apparent in the eighth.

Cases have been brought forward to prove that the swellings found in the labia and inguinal regions in some cases of abnormal development of the sexual organs are testicles. Such a conclusion is difficult to substantiate even with the aid of microscopic examination. I am inclined to think that in some of these cases the structures found represent a stage of development in which the distinction between ovary and testicle is not marked.

Again, in the foregoing cases pains are noted as occurring at the menstrual periods. These pains are of varying degrees of severity, and in certain cases removal of the ovaries has been recommended. Careful inquiry into the previous history of such patients will show that in many these pains originated after seeking medical advice, when the medical attendant had incautiously informed the sufferer of her condition. The influence on the mind of a patient produced by the use of complex medical terms, especially those popularly believed to be of serious import, must never be forgotten in dealing with disease in the female sex, and the more so, if, as in some of the cases narrated, the patients belong to that class to which the term neurotic is applied. Cases requiring removal of the ovaries must be very rare, and I feel sure most will yield to general treatment.

Uterus. A study of the examples described shows a gradual transition from complete absence of the uterus to the infantile form.

1. There are cases in which no uterus is present, the vagina being a cul-de-sac.

2. Cases in which at the blind end of the vagina a nodule is found occupying a central position; this nodule has no canal in its interior.

3. Cases in which the nodule previously mentioned forms the lower portion of a small central body admitting the point of a probe.

4. Cases in which the probe can be passed for a distance of one-half to

three-quarters of an inch into a body, cord-like or spindle-shaped, occupying a position corresponding to the normal uterus.

The last group forms a transitional stage preliminary to what is called the infantile uterus, which may persist throughout adult life, and is the normal condition in the female child at full term. Examples of infantile uterus are sufficiently common, so that a detailed description is unnecessary. The uterine body is short; the cervix, one and one-half inches long, is two or even three times the length of the body (one-half to three-quarters of an inch). The whole uterus is smaller than normal. The walls, especially of the body, are thin and the cavity small. It will be seen that where there is a total or partial absence of a uterus the vagina is abnormally short.

The first case narrated shows the defective formation of the recto-vaginal septum, the anus being in the normal position. As the exact manner of the formation of this septum is not definitely ascertained, all such cases of defective development should be recorded. The anus being developed as an ingrowth from the exterior explains the relation in this particular case.

External Genitalia. It is interesting to observe how frequently the external genitals are fully formed while there is total or partial absence of those situated internally. A certain number of cases exist in which there are one or more defects in structure. The pubic hair may be entirely absent, the clitoris rudimentary or unusually enlarged, or a dense imperforate barrier may be present in the position of the hymen. We have further to note the occasional presence of swellings in the labia, some stated to be testicles, others ovaries, although more commonly containing bowel. The frequent occurrence of herniæ in the cases described serves to illustrate what has been commented upon by several authors, viz., the association of deformities.

Condition of the Breasts. The breasts may be poorly developed or no alteration noticed, both the breast-tissue and the nipples being well formed.

General Development. Patients exhibiting abnormalities of the genital apparatus may be divided into three types: masculine, feminine, and infantile.

1. *The Masculine Type.* Here there is an approach to the characters distinctive of the male sex. A growth of hair on the upper lip, chin, and cheeks may exist. The voice is masculine. The breasts resemble those of the male sex; nevertheless well-developed mammary glands are frequently noted. Hair around the nipples is occasionally seen. The pubic hair is continued up the linea alba to the umbilicus, thus resembling the distribution in the male. The shoulders are broad, and the pelvis corresponds to the masculine type. These characters, although possessed by certain females whose genital organs are abnormally formed,

are also found where the genitalia are well formed. Many females of the masculine type (with well-formed genitals) bear children despite the popular belief to the contrary.

2. *The Feminine Type.* Under this head are included those cases in which in appearance and general development there is no departure from that of the human female excepting the abnormality of the genital organs.

3. *The Infantile Type.* The characters of this type resemble those of the infant, hence the name. There is frequently feeble general development, with smallness of stature. The breasts are poorly developed. The axillary hair is absent, also the hair covering the pubis. The pelvis is small.

Such a classification is convenient and sufficiently accurate for practical purposes.

In conclusion, let me again express the hope that all cases of abnormality of the female genitalia will be published and their relation to development studied.

CHRONIC TYMPANIC VERTIGO; ITS RELIEF BY SURGICAL REMOVAL OF THE INCUS.

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In January, 1892, I reported[1] ten cases of chronic catarrhal deafness, tinnitus aurium, and vertigo treated by excision of the membrana tympani and the two larger ossicles, with the following results:

Deafness relieved in	4	cases out of	10
" not relieved in	6	" "	10
Tinnitus greatly relieved in	3	" "	10
" somewhat relieved in	5	" "	10
" not relieved in	2	" "	10
Vertigo not present in	3	" "	10
" greatly relieved in	5	" "	10
" slightly relieved in	2	" "	10

The greatest average of success of this treatment is seen in the relief of the vertigo; the lowest in the deafness. It is thus shown that chronic tympanic vertigo can be relieved by total excision of the membrana and the malleus, the incus being allowed to remain in position; but as this operation is invariably followed by more or less inflammatory reaction, I have abandoned it for simple incision in the membrana and removal of the incus, which liberates the stapes most completely and is never followed by reaction of any moment.

[1] International Clinics.

I now present notes of sixteen additional, unselected, consecutive cases of chronic catarrhal deafness, tinnitus, and tympanic vertigo (so-called Ménière's disease) in which the vertigo was the prominent and annoying symptom and chiefly for relief of which the operations were performed. Most of these cases before seen by me had been treated with internal remedies for "neurasthenia," "biliousness," etc., but without any relief, the lesion in the ear not having been recognized as the cause of the vertigo. In nearly all of them, Cases XI. and XXVI. excepted, my operation for relief consisted in removal of the incus only. This liberated the stapes, the inward pressure of which, by the retraction of the membrana, malleus, and incus, I believe to be the prime cause of tympanic vertigo.

Tympanic vertigo is a term I suggested some time ago for that form of ear-vertigo produced by chronic catarrhal otitis media. It is characterized by paroxysms of increased tinnitus, vertigo, and nausea, with, at times, reeling, falling, and vomiting, but no loss of consciousness. To this vertigo the name of Ménière's disease has been frequently very erroneously applied. The term Ménière's disease is now limited in its application by aurists to disease of the internal ear, a rare malady, however.

In every case of so-called chronic catarrh of the middle ear there is a tendency to thickening, contraction, and stiffening of the mucous membrane lining the drum-cavity and covering its contents. This tends to retraction of the membrana tympani and the ossicula through contraction of the tensor tympani muscle, with consequent impaction of the stapes in the oval window. The membrane of the round window, which normally furnishes a yielding point to the inward pressure of the stapes upon the labyrinth-fluid, being thickened and stiffened by the chronic catarrhal process in the tympanic cavity, fails to yield to the retraction of the stapes, the labyrinth-space is thus compromised, the labyrinth-fluid and the motor filaments of the auditory nerve compressed, the cerebellum reflexively irritated, and motor disturbances in equilibrium of a vertiginous form are paroxysmally excited.

The paroxysmal nature of the tympanic vertigo is due to the fact that the above-described retraction and impaction of the larger ossicula with the stapes vary with the catarrhal state of the nasopharynx, the general health of the patient, and the condition of the atmosphere.

The physical causes of the attacks of vertigo being as above described, it seems rational to suppose that if this retractive power over the stapes could be permanently overcome the vertiginous paroxysms would be permanently checked. This can be effected best and most safely, as already stated, by surgical removal of the incus only.

The following cases demonstrate that chronic tympanic vertigo is produced as described, because it is relievable by the removal of the incus and consequent liberation of the stapes.

CASE XI.[1] *Deafness, tinnitus, vertigo; cicatrized purulent otitis media; excision of the membrana tympani and remnant of the malleus; no relief from any of the symptoms.*—August 17, 1892. T. N., aged fifty-three years, a carpenter. The patient states that last winter he had a fall, striking his head. In April following he had a severe cold, with running from his right ear. The ear stopped running in June, since which time, about three months, he has suffered from constant tinnitus in that ear, with dizziness at times, which he attributes to the condition of the ear. He inclines markedly toward the well side when dizzy, and more or less so all the time in walking. He has nearly fallen at times, but never entirely, and he has never lost consciousness in any of the attacks of vertigo. He has been unable to do any work since his fall, six months previous to the above date.

The hearing for the voice in the right ear was very much reduced; but the tuning-fork was heard through the air about one inch, and well through the bones of the head. Examination revealed a large cicatrized perforation in the posterior upper quarter of the drum-membrane. The cicatrix moved under Siegle's pneumatic speculum, but the rest of the membrana was immovable, the handle of the malleus being partly destroyed. The left ear presented symptoms of catarrhal otitis media, with profound deafness, but no tinnitus.

On August 25th, the patient under ether, the membrana and remnant of the malleus were removed by excision. The incus was neither seen nor felt.

There was no change in this man's condition from the operation; he still inclined toward the left side in walking. By September 10th there was a slightly painful reaction for a few days, followed by some discharge from the ear. He was seen as late as March 14, 1893, when it was found that there was no regeneration of the membrana. He still inclined toward the left side in walking, and upon the whole I could see no improvement from the operation. Probably there had been a central lesion from the fall mentioned above.

This was the last instance in which I performed total excision of the membrana tympani for the relief of symptoms of chronic catarrh of the middle-ear. Abandonment of this operation is due to the fact that it is followed sooner or later by more or less severe reaction in the drum-cavity and regeneration of the membrana. It is true that I have relieved vertigo and tinnitus by such an operation, but as the same relief can be given by the simple and harmless removal of the incus I have resorted to this operation for the past three years.

CASE XII. *Deafness, tinnitus, and vertigo; chronic catarrhal otitis media in the left ear; removal of the incus; tinnitus and vertigo relieved; hearing unchanged.*—June 7, 1893. Mrs. G., aged fifty-five years, of Clearfield County, Pa., states that she had been dull of hearing in the left ear since childhood, with increasing tinnitus for many years. Three or four years ago she began to have attacks of ear-vertigo, but she was treated for "neurasthenia" by another physician. For the last year the attacks of vertigo have increased in frequency, occurring as often as once a week. Tinnitus is always worse at such times. The tuning-fork is heard in the left ear through the bones.

[1] The numbering begins as a continuation of cases like those in the first series named above.

Examination of the ear revealed a retracted membrana and a plainly visible incus. The attacks of vertigo lately have obliged her to go to bed. They have come on, usually, suddenly and when she has been in the house. However, the last one, which was quite severe, came on while she was driving. There is no catarrh of the nares and pharynx. A loud voice can be heard close to the ear.

On June 7th, the patient being under ether, tympanotomy was performed, the incus-stapes joint exposed, and the incus, though tightly held in place, was removed. The stapes was found to be firmly anchylosed in the oval window, and upon pulling upon it with a small hook between the crura the latter broke. Within two weeks following there were one or two very slight attacks of vertigo which lasted but a few moments.

In the course of six months this patient became entirely free from vertigo, and was able to attend to her household duties.

CASE XIII. *Cicatrized purulent otitis media, right-ear; perforation in the membrana tympani; incus plainly visible; deafness, tinnitus, and vertigo; removal of the incus; relief of all the symptoms.*—June 27, 1893. Sister St. —, aged thirty-two years, for many years has had chronic naso-pharyngeal catarrh. The patient has complained for some months of increasing tinnitus in the right ear, accompanied by vertigo, and now desires relief, especially from the latter. Hearing for the voice two feet for isolated words.

On June 28, 1893, the patient being under ether, I enlarged the perforation in the upper posterior quarter of the membrana tympani and removed the incus. There was no reaction in this case, and the patient, who left the city the day after the operation, was not seen for a month, when it was found that the hearing in the right ear was for whispered words from eight to ten inches, and for loud words from four to six feet. There had been no vertigo or tinnitus.

As late as June, 1894, the patient reported that she had remained entirely free from tinnitus and vertigo and that she had retained her improved hearing.

CASE XIV. *Chronic catarrhal otitis media in both ears; deafness, tinnitus, and vertigo; removal of both incudes; entire relief from vertigo.*—July 19, 1893. Mr. C. C. T., of Maryland, aged thirty-one years. The hearing in this case began to fail eight years ago in the right ear and four years ago in the left. The patient had manifested marked ear-vertigo for a year, having grown much worse within two months, always being dizzy upon stooping and sometimes when walking in the street. There was most tinnitus of a whirring nature in the right ear; less tinnitus in the left ear. A loud voice could be heard in the right ear. The hearing was a little better in the left ear. A large tuning-fork could be heard very well in both ears through the bones.

On July 20th, the patient being under ether, I performed resection of the long process of the incus in both ears, the bodies of the bonelets being left *in situ*. The hearing improved in both of the ears. The tinnitus was greatly diminished, and there were no further attacks of ear-vertigo. In the course of two months the patient was able to resume his business as a bookkeeper on account of his improved aural condition. Unfortunately two months later he slipped upon an asphalt pavement on a wet day in Chicago, where he had gone to live, struck his head upon the curbstone and fractured his skull, dying in consequence thereof.

CASE XV. *Chronic catarrhal otitis media in the right ear after mumps,*

tinnitus some years later; fifteen years later first attack of tympanic vertigo; removal of the incus; entire relief in the course of six months.—October 2, 1893. Mr. J. C., of Ohio, aged thirty years, states that eighteen years ago after mumps his right ear became deaf, and in the course of two or three years he began to suffer from tinnitus in that ear. Three years ago in the evening, after a hard day's work in a shoe-store, he experienced his first attack of vertigo, before which, during the entire day, he observed that the tinnitus in the right ear was much worse. The attacks of vertigo became more and more frequent for three years during the winter and spring. During the summer and autumn he was comparatively free from them.

At the time of my first examination the tuning-fork was well heard in the right ear through the bones. Hearing for the voice in this ear was very much reduced.

On October 3d, the patient being under ether, I incised the membrana tympani in the upper posterior quadrant and removed the incus. There was no reaction, and the membrana tympani closed in a few days and the patient returned to his home. During the eleven following weeks the patient had two slight attacks of dizziness, but no reeling or vomiting. Under date of April 26, 1894, the patient informed me that he had had no attacks of vertigo except those mentioned above, since the operation, and that he considered himself entirely cured.

CASE XVI. *Chronic catarrhal otitis media in both ears; profound deafness and tinnitus aurium; intense vertigo, with reeling and falling at times; removal of both incudes; immediate and entire relief.*—October 11, 1893. Mr. W. R. T. P., of Philadelphia, aged fifty-eight years, formerly a sea captain, states that about fifteen months ago he first noted failure in hearing in the left ear and soon after in the right ear. A year ago he observed that he was at times vertiginous. Within three months of that time the attacks of vertigo became more frequent and intense. He never lost consciousness and fell, but he has been obliged to sit down in the street on the pavement, and sometimes to catch hold of posts, etc., in order to avoid falling.

The tuning-fork is heard through the bones in the right ear, but not in the left ear. The tinnitus aurium is not constant. He can hear the voice in the right ear by means of the ear-trumpet. The membranæ are normal in appearance and the incudes are plainly visible.

On October 16th, the patient being under ether, both incudes were removed. Two days after the operation it was observed that he could hear in the left ear much better than he had heard for a long time, while the hearing in the right ear appeared to be temporarily worse. The next day, however, the hearing in the right ear became as well as it was before the operation and has remained his better ear. The improved hearing in the left ear continued as long as the perforation in the membrana remained open. After it closed the hearing in the left ear became as poor as it was before the operation.

Two weeks after the operation, after a hard day's work, he noticed some tinnitus and felt a little dizzy, but these symptoms disappeared upon his lying down and resting. I have observed this case ever since the operation, and am able to record that there has been no attack of vertigo. The patient hears better in the right ear than he did before the operation and is fully able to transact all his business without even the fear of an attack of incapacitating vertigo.

CASE XVII. *Chronic catarrhal otitis media of the right ear; probably rendered worse by traumatism; deafness, tinnitus, and vertigo; removal of the incus; immediate relief.*—October 4, 1893. Mr. C. S., of Philadelphia, aged sixty years. The patient stated that four months before I first saw him he had fallen down stairs, striking the top of his head, and remained unconscious for two weeks thereafter. He states that he fell in consequence of an attack of vertigo as he was going upstairs to bed. Ever since his fall he has had attacks of uncertainty of gait at times, not attended with any increase of tinnitus. He said that his ears were well before his fall. Now there is constant tinnitus. Hearing for the tuning-fork through the bones reduced in both ears. Inspection of the right ear shows that the malleus is movable under the pneumatic speculum. The posterior half of the membrana is crinkled and white, but this part of the drum-membrane moves under the pneumatic speculum. The suction exercised by this instrument upon the membrana makes the ear feel better, but does not quell the tinnitus. The left membrana tympani is very white and lustreless.

In my opinion this patient has been the subject of chronic catarrhal otitis media in both ears for some time before his fall, as his vocation as an oysterman has exposed him to all kinds of bad weather. It seems to me that in consequence of the fall and blow upon the head that the trophic disturbances in the right ear became worse, although I am convinced that the chronic aural catarrh in the right ear induced the vertigo which led to the fall.

On October 23d, the patient being under ether, an incision was made in the upper posterior quarter of the membrana, and the incus, which was found very adherent, was removed. There was no inflammatory reaction in this ear, and in the course of four days there was decidedly less tinnitus and the man's gait was much more steady. In consequence of the diminished tinnitus he began to sleep much better at night, became much stronger and more active upon his feet, and felt well satisfied with the result of this operation.

The improvement in this man was maintained, as I am able to state from a prolonged observation of the case.

CASE XVIII. *Chronic catarrhal otitis media in the right ear, probably of traumatic origin; deafness, tinnitus, and vertigo; removal of the incus; immediate partial relief.*—November 20, 1893. Mr. W. H., of Philadelphia, aged fifty-six years, states that he was struck by a locomotive a year previously and thrown many feet into the air, and coming down struck upon his head, sustaining a compound comminuted fracture of the skull in the right upper parietal region. He remained unconscious and delirious for two weeks. Immediately upon leaving the hospital in Wilmington, Delaware, where he was taken after the accident, he observed deafness and tinnitus in the right ear, and has suffered from more or less tympanic vertigo ever since. Before the accident the right ear was perfect in every way. At the time of my first examination it was found that the tuning-fork was not heard well through the bones in the right ear and that deafness to ordinary vocal sounds was great.

On November 23, 1893, the patient being under ether, the incus was removed in order to relieve the tinnitus and tympanic vertigo. After the operation there was immediate partial relief from tinnitus and vertigo, and the hearing for the voice improved in the right ear, being heard as far off as six inches from the ear.

His memory and intellect became better in the course of two months, but he experienced some months later (February 8, 1894), during stormy weather, some tinnitus in the right ear and a little vertigo. This case remained decidedly improved regarding tinnitus and vertigo until the fall of 1895, when he suddenly became hopelessly insane, evidently from the injury to the skull and brain.

CASE XIX. *Chronic catarrhal otitis media; deafness and tinnitus; chronic tympanic vertigo more or less constant, with severe paroxysms; removal of the incus; entire relief.*—December 13, 1893. Mrs. K., of Maryland, aged forty-six years, states that over three years ago she suffered from a bad attack of catarrhal inflammation of the nose and head. Soon thereafter she experienced dulness of hearing and tinnitus in the left ear. Fifteen months later she began to suffer from vertigo in consequence of the irritation she experienced in the left ear. The vertigo was more or less constant with frequent bad paroxysms of increase—as often as two or three times a month. Examination revealed a very thick membrana tympani on the left side.

On January 23, 1894, the patient was etherized and the incus removed. There was immediate improvement in walking, and the patient felt entire confidence in going about alone. For some months before the operation she was unwilling to walk about without an attendant. I have heard repeatedly from this patient, and she has remained entirely free from the annoyance of chronic tympanic vertigo, but the hearing in the left ear is very poor. The hearing on the other side had been lost in early life through a chronic purulent otitis media.

CASE XX. *Cicatrized chronic purulent otitis media; persistent perforation; enlargement of the latter upward; removal of the incus; immediate and entire relief.*—February 1, 1894. Mr. W. P., of Philadelphia, aged thirty-four years, a clerk, consulted me regarding deafness and tinnitus in the right ear, followed recently by attacks of ear-vertigo.

Examination revealed on the right side a large heart-shaped perforation in the membrana tympani with cicatrized edges, the contents of the tympanum being plainly visible through the perforation. The patient had considerable naso-pharyngeal catarrh, which under antiseptic treatment of the nares improved, but the tinnitus and vertigo seemed to be entirely uninfluenced by the nasal treatment. Finally, by February 24th, the tinnitus and vertigo had increased to such an extent as to render the patient unable to walk about without an attendant. I advised removal of the incus, to which the patient acceded, and this operation was performed on March 2, 1894. There was immediate and entire relief from the vertiginous symptoms, but the tinnitus has continued more or less ever since the operation, though without its former intensity. The stapes in this case has remained plainly visible. There has never been any running from the middle ear, and the stapes is very easily movable by means of a probe, yet the hearing has never been much improved in this case by the operation, though the stapes, as just stated, is very movable.

CASE XXI. *Chronic catarrhal otitis media; deafness, tinnitus, and vertigo; resection of the long process of the incus; relief.*—March 14, 1894. Miss P., of New York, aged forty-seven years, has presented symptoms of chronic catarrh of the right middle ear for many years past. Within the last few years she has experienced several attacks of not very severe aural vertigo.

On March 16, 1894, the patient being under ether, the right membrana tympani, which was greatly thickened and retracted, was incised. The incus-stapes joint was not visible through the incision in the membrana tympani, but by means of the incus-hook the long process of the incus was drawn down into view. The incus being very adherent, the entire bone could not be removed, therefore the long process was seized by cutting-forceps and resection of this portion of the bonelet was effected.

There was no reaction, and in the course of two months the hearing had slightly improved, the tinnitus had lessened, and there had been no more attacks of vertigo. The patient has remained entirely free from such attacks up to the present time.

CASE XXII. *Chronic catarrhal otitis media, left side; deafness, tinnitus, and vertigo; removal of the incus; improvement in hearing; lessening of the tinnitus and relief from vertigo.*—March 21, 1894, Mrs. G., of Philadelphia, aged fifty-three years, was examined by me for the first time, and was found to present well-marked symptoms of chronic catarrh of both middle ears. The left ear was apparently the worse, and its condition was deemed to be the cause of the ear-vertigo. On March 21st, the patient being under ether, the left membrana tympani was incised and the incus exposed. It was found to be placed very high in the attic, but was finally drawn down and removed from the drum-cavity. In the course of four days this patient had some pain in the ear operated upon, not attended with discharge; but in a few days, under the application of dry heat, all pain ceased and symptoms of reaction disappeared. By April 18th it was reported by her physician, at whose suggestion I had operated, that the patient heard better, but that the tinnitus was no better. By April 25th the perforation in the membrana tympani had closed. The patient still complained of tinnitus in her head and ear, as she said, but she had had no attacks of dizziness, and so far as I know has remained entirely free from ear-vertigo up to the present time.

CASE XXIII. *Chronic catarrhal otitis media in both ears; deafness and tinnitus most marked in the right ear; vertigo; removal of the incus; relief.*—April 2, 1894. Mrs. E. J. C., aged fifty years, has presented symptoms of chronic catarrh of both middle ears for many years past. Within the last four months has had most tinnitus, deafness, and general discomfort in the right ear, from which she hears very little. The left ear is able to hear isolated words at a distance of one foot. This patient underwent an operation for ovariotomy four years ago. The ears seemed no worse after the operation until four months ago, when the right ear presented the symptoms named above. The tuning-fork was heard two inches through the air on the right side and four inches through the air on the left side. The right membrana tympani moves well under the pneumatic speculum, which manipulation of the ear renders the patient dizzy and uncomfortable. The membrana tympani was very obliquely placed in this subject, the malleus seeming to be drawn upward and backward, and the incus was not visible through the membrana.

On April 17, 1894, the patient being under ether, an incision was made in the membrana tympani and the incus was found to be placed very high in the attic. After forty-five minutes' patient labor the incus was drawn into view and removed. There was no relief in this case for ten days. On April 27th, however, the patient said that she could hear

better, and it was found that she could hear the tuning-fork through the air an inch or two further than she could before. The patient stated that the words she now heard were much more plainly distinguished than they were before. Formerly they all ran together, but now she could hear words much more distinctly than before the operation. The tinnitus was much lessened. The tongue in this case was somewhat numb on top for some time after the operation, a condition due to irritation of the chorda tympani. This sequel of the operation, however, disappeared in a short time, and the patient has remained free from vertigo.

CASE XXIV. *Chronic catarrh of the left middle-ear; hysterical subject; deafness, tinnitus, and vertigo; removal of the incus; no relief.*—December, 1895. Miss R., of North Carolina, aged twenty-five years. For several years this patient has presented symptoms of chronic catarrh of the left middle ear, with increasing deafness and tinnitus. Last summer, after prolonged nursing day and night, of an ill relative, she suffered from marked nervous prostration, with increased tinnitus in the left ear, and attacks of ear-vertigo from the irritation in the ear.

Examination revealed that the voice could be heard close to the left ear. A watch was not heard on contact. On December 31, 1895, the patient being under ether, the upper posterior quadrant of the membrana tympani was freely cut away at its periphery and turned forward, and the incus-stapes joint exposed. The incus was easily separated from the stapes and removed.

In the course of a week the tinnitus was said to be less and the vertigo relieved; but subsequently with general hysterical conditions the tinnitus and vertigo seemed to be no better. The case went home about the first of February, 1896, and has been lost sight of.

CASE XXV. *Slight symptoms of chronic catarrh of both middle ears for eight years; tinnitus and dulness of hearing in both ears; finally tinnitus and deafness most marked in the right ear; intense vertigo from irritation in the latter; removal of the incus; relief.*—February 7, 1896. Mr. E. M. B., of Westmoreland County, Pa., aged thirty-seven years, a farmer, states that he first noted tendency to vertigo in 1888. There was no tinnitus at that time. The first attack of vertigo came on at night, and was severe enough to cause vomiting. He suffered from headache for several days thereafter. There were three or four attacks of vertigo in the three or four subsequent months, there being no relief from these attacks until he vomited. Two years later tinnitus was added to the symptom of vertigo. There came a period of relief, however, from these attacks between May, 1888, and May, 1890, after his vision was corrected. The hearing then began to fail, and the attacks of vertigo began again, and seemed to be more intense in their character. The tinnitus which appeared in both ears grew worse in the right ear, and is now very much worse in the right ear. Since 1892 he has had constant symptoms of ear-vertigo. Inspection reveals a membrana tympani normal in appearance, but that the malleus is nearly immovable under the pneumatic speculum. There is constant and distressing tinnitus in the right ear. The tuning-fork cannot be heard through the bones on the right side; the nares and pharynx are in good condition. The tuning-fork is heard between one and two inches through the air on the right side and from two to four inches through the air in the left ear. The knee-jerk is fair; but the patient walks badly, especially with his eyes closed and in the dark. He sleeps poorly, and is very apprehensive

that he will fall if he walks about. His spirits are fairly good and his intellect entirely clear. There is no history of any syphilitic taint nor of any hereditary dyscrasia. His physician, who accompanied him, stated that he believed him to be of a good constitution. The patient had reached the condition which made him unwilling to walk about alone; he had rather an anxious expression, and his pupils were widely dilated.

Thinking there might be some cerebellar disease, I asked the patient to consult Dr. Sinkler, who informed me that "although it might be thought at first sight that Mr. B.'s case was one of cerebellar disease, the absence of some important features made him believe that the disease was purely aural vertigo, the most intense form, however, he had ever seen."

On February 8, 1896, the patient being under ether, the right membrana tympani was incised in the upper posterior quadrant and the incus-stapes joint revealed. The incus was easily detached from the stapes and removed from the drum-cavity. The patient grew better in the course of a week, was fully able to walk about the city alone, and was no longer made dizzy by objective noises, as he was for some time before the operation, when even the sound of his own voice would make him dizzy at times. This was effected, as I think, by the sound of the voice impinging on the membrana tympani and increasing the inward pressure of the anchylosed malleus and incus upon the stapes.

The tinnitus in this case remained more or less distressing, although the gait was so much improved and the vertigo vanished. The patient returned to his home in ten days after the operation.

Under date of February 24th the patient wrote that he at times had considerable tinnitus and slight tendency to dizziness, which made him feel rather timid about walking.

Under date of March 13, 1896, his physician wrote that, although Mr. B. had had considerable tinnitus and one or two bad attacks of vertigo, on the whole his condition was very much better than before the operation.

Under date of April 16th his physician writes again that the patient suffers a good deal still from tinnitus, but the tendency to vertigo is slight, and that the hearing in the ear operated upon is slightly improved, as he hears some sounds now which he did not hear before the operation. There has been no vertigo bad enough to make the patient fall, but the dizziness at times is pretty bad. He is able, however, to be up, and does some work about the house, though he is in fear of an attack of vertigo.

I believe this case is presenting the same features that some other cases of ear-vertigo have shown, namely, a gradual improvement after operation in a condition which came about gradually for many years. By reference to the notes it will be seen that this man suffered with increasing symptoms of ear-vertigo for eight years and that he was at last unable to walk about alone. Immediately after the operation and ever since he has been able to walk about alone, although he is not entirely free from tinnitus and ear-vertigo.

Under date of April 24th his physician wrote that the patient is much discouraged by a continuation of general tinnitus and considerable dizziness. This condition may be due to the catarrhal state of the left ear, which it must be remembered was nearly as much affected as the ear operated upon. If this tendency to vertigo does not abate, an

operation upon the left ear should be contemplated, as in two of the worst cases reported both ears were operated upon with the best results.

CASE XXVI. *Chronic purulent inflammation of the attic; slight discharge; deafness, tinnitus, and vertigo; removal of the remnant of the malleus; relief of all the symptoms.*—February 26, 1896. L. —., of Philadelphia, aged twenty-one years, complains that she has suffered from noise and deafness in the left ear for some time, and of late with frequent attacks of dizziness which oblige her to hold on to a support to prevent her falling. Otoscopic examination revealed a suppuration in the left attic space, with a large perforation in the membrana flaccida, through which the neck of the malleus could be seen. The membrana vibrans was seen to be greatly thickened, cicatrized, and indrawn.

February 29, 1896, the patient being under ether, I cut downward and backward from and through the posterior edge of the perforation in the flaccid membrane corresponding to the posterior fold of the membrana tympani, sweeping around and beneath, forward and in front of the malleus, and removed the latter bonelet. Its head was found to have been destroyed by necrosis, and the incus was not found. The purulent discharge ceased at once, the tinnitus was quelled, and there were no more attacks of vertigo during the few weeks after the operation the patient remained in the Presbyterian Hospital.

As already stated, in all of these cases the intratympanic operation was performed primarily for the relief of chronic tympanic vertigo of chronic catarrhal origin. It is very instructive, however, to note the incidental effects of the operations upon the accompanying tinnitus and deafness.

All the operations were performed upon the etherized patient, and the ear being previously mopped or syringed with a bichloride solution, was illuminated by means of a six-volt electric lantern held on the operator's forehead with the ordinary forehead-band, like that used for holding the forehead-mirror. The current was supplied by a small portable (11½ pounds) storage-battery, made for me by the Electro-dynamic Company, of Philadelphia. No inflammatory reaction with discharge ensued after any of the operations excepting in Case XI., in which total excision of the membrane was performed; but, as stated already, I have abandoned that operation in such cases. In Case XXI. there was some pain, but no discharge from the ear, for a few days after the removal of the incus, as may be learned by reference to the notes.

Most of the cases (12) presented the ordinary symptoms of chronic catarrh of the middle-ear, without symptoms of previous purulency.

Three cases, however, presented symptoms, as well as the history, of having suffered from chronic purulency of the middle-ear; two with large perforations in the membrana, with cicatrized edges and cicatrized drum-cavity (Cases XIII. and XX.), and one with a cicatrized perforation and partly destroyed malleus (Case XI.). One case (XXVI.) presented a condition of active purulency in the attic at the time of the operation.

The following synopsis of results of the operations in these sixteen additional cases of chronic tympanic vertigo shows that the highest average of success was attained in the relief of vertigo, as in the first series. In the incidental results of the operations the tinnitus shows a higher average of relief than the deafness. In Cases XI. and XXIV. there was no relief in any respect.

Results. Vertigo relieved at once in ten cases; vertigo relieved gradually in four cases; vertigo unchanged in two cases; tinnitus lessened in thirteen cases; tinnitus unchanged in three cases; hearing improved in nine cases; hearing unchanged in seven cases.

SOME INVESTIGATIONS AS TO THE VIRULENCE OF THE DIPHTHERIA-BACILLI OCCASIONALLY FOUND IN THE THROAT-SECRETIONS IN CASES PRESENTING THE CLINICAL FEATURES OF SIMPLE ACUTE ANGINA.

By Hermann M. Biggs, M.D.,
of New York.

It is very difficult to dislodge from the minds of most practitioners of medicine the purely anatomical conception of diphtheria. Up to the period beginning with the discovery of the Klebs-Löffler bacillus and the development of the methods of bacteriological examination in the diagnosis of this disease, diphtheria was generally regarded as an inflammation of the respiratory mucous membrane, characterized by the formation of a false membrane, and this false membrane was considered to be the diagnostic feature of the disease.

Notwithstanding that previous clinical experience had shown that this was not a reliable criterion for the diagnosis of diphtheria, and notwithstanding that the evidence derived from thousands of bacteriological examinations in acute throat-affections has demonstrated the fallacy of this view, there still remains the firm belief with a large proportion of the profession that only such cases of acute angina are to be regarded as diphtheria as present at some time in their course more or less membrane. So thoroughly has this idea become fixed, and so strong is its influence upon practice, that many even of those physicians who unhesitatingly accept the Klebs-Löffler bacillus as the essential cause of diphtheria are still guided by it in their sanitary treatment of cases of true diphtheria which simulate simple angina, and they do not regard the isolation and subsequent observation of such cases as either necessary or advisable.

Physicians readily enough acquiesce in the isolation of cases of mild scarlatina or variola until complete desquamation has occurred, and no question arises as to the danger of transmission of such diseases to other persons through contact with mild forms; but similar reasoning is not allowed to apply to diphtheria.

The observations of Roux, Koplik, Park, and others long ago proved that simple catarrhal angina, or what seemed to be clinically simple catarrhal angina, might be caused by the diphtheria-bacillus. This fact was clearly brought out in an admirable paper by Koplik, published in 1892. Long before this time Trousseau, Jacobi, and other clinicians had shown that frequently during epidemics of diphtheria clinical anginas occur which are as prostrating as those associated with the formation of membrane; and, in 1890, Roux directed attention to the fact that such cases, or very mild forms of angina without subsequent prostration, were not infrequently the origin of severe epidemics of diphtheria. The investigations of many observers, on the other hand, have proved that the presence of membrane does not necessarily indicate the existence of diphtheria, as membranous inflammations of the throat may be produced by other organisms than the diphtheria-bacillus.

The purpose of the series of investigations detailed in this paper was to fix the exact value to be attached to the ordinary routine bacteriological examinations in determining the true character of the cases described. It was desired to ascertain in how large a proportion of the cases of simple acute angina the diphtheria-bacilli would prove to be virulent in animal-tests when they appeared to be typical in form and staining. Previous experience had led us to believe that the bacilli in such cases were almost invariably fully virulent.

The cultures selected for the observations were chosen from those received at the New York Health Department laboratories, in which diphtheria-bacilli were apparently found on microscopical examination and in which the physician's diagnosis was doubtful or was tonsillitis. In some instances the diagnosis accompanying the cultures was simply tonsillitis; in others it was follicular, ulcerative, membranous or pseudo-diphtheritic tonsillitis, or pseudo-diphtheria, or acute pharyngitis, or diphtheria with an interrogation-point. When cultures were received that had some such diagnosis as those referred to, and microscopical examination showed that they contained apparently typical diphtheria-bacilli, the bacilli were plated out, pure cultures obtained, and their virulence then tested upon guinea-pigs in the usual manner.

The bacilli derived from cultures made from forty-eight cases of this type were tested, and in only three instances were the organisms found to be non-virulent. In all of the remaining forty-five cases the animal-tests showed them to be fully virulent. I may say, in passing, that

before the virulence of any culture was tested the character of the bacteria present in it was usually passed on by Dr. John S. Billings, Jr., and Mr. Alfred L. Beebe, who commonly make the routine examinations, and Dr. William H. Park and Dr. Anna L. Williams, who plated out the cultures and tested the bacilli for virulence. All these persons have had a very large experience in bacteriological work connected with diphtheria, and it will be readily understood that many cultures were thrown out as not showing typical Löffler bacilli, although they would be generally regarded as such. The subsequent history of the cases was obtained from the attending physicians by inspectors of the Health Department, and inquiry was made in each instance as to the source of infection and as to the occurrence of other cases in the family.

In four of the forty-eight cases the subsequent history could not be obtained. Of the remaining forty-four, fourteen presented throughout their illness the clinical features of typical acute follicular tonsillitis, and in all of these the reports showed that the cases were of a mild character, and convalescence was fully established in from three to five days. In three instances the course of the disease was that of a simple acute pharyngitis of a mild type. In none of these seventeen cases was there any membrane in the throat at any time during the illness, and nothing in the clinical history suggested diphtheria. In a number of them the original cultures were sent by the physician in attendance, because one or more cases of diphtheria had already occurred in the family or in the institutions in which the patients were inmates, and in others the cultures were sent simply as a matter of routine, as is frequently done by many physicians in New York City. In one additional case the early history was that of a follicular tonsillitis, from which the child was apparently entirely convalescent, when suddenly croup developed with laryngeal stenosis, and intubation was required; in another the history was that of a follicular tonsillitis, excepting that after three or four days' illness the child became hoarse and had a croupy cough. No antitoxin was administered, however, and the patient soon recovered. In the remaining twenty-five cases, while originally the diagnosis by the attending physician was follicular tonsillitis or was considered to be doubtful, ultimately membrane appeared, and the course of the disease finally was that of a more or less severe diphtheria.

Excluding the twenty-five cases in which ultimately the patients developed characteristic symptoms of diphtheria, there remain the nineteen cases which were clinically follicular tonsillitis or pharyngitis, with in two instances the development late of some laryngeal symptoms. In seventeen of these the tests upon animals showed that the bacilli found in the cultures were fully virulent.

In the analysis of this series of nineteen cases of apparently simple angina, associated with the presence of the Löffler bacillus, as to the history of contagion, it was found that four occurred among the inmates of various institutions for children, in which diphtheria was at the time prevailing. In six of the remaining there was a history of previous or subsequent cases in the family, or the child was known to have been in contact with some person suffering from diphtheria. The history on this point in four cases was not given. It will be seen, therefore, that in ten out of fifteen in which the history was obtained there was reasonable evidence of contagion.

Examination was also made of the records in these nineteen cases to show the duration of persistence of the Löffler bacillus. This could be determined in fifteen of the series. The Löffler bacilli had disappeared in most of these cases within eight days of the time of the first culture. In one instance, however, they persisted for twelve days, in another for eighteen, and in another for thirty days. No subsequent tests for virulence were made during the persistence of the bacilli.

An important question arises in this connection as to the frequency with which true diphtheria simulates simple angina. There are no data at the command of the Health Department in New York which throw any light upon this phase of the subject. It has been found, however, that where virulent diphtheria-bacilli are present in normal throats, as a rule, the history will disclose some recent exposure to diphtheria, and in a majority of the cases here described investigation proved that there was a definite source for the contagion.

From April 1st to the 28th notes were made of the clinical and bacteriological diagnosis in every case from which cultures were received in the New York municipal laboratories. The number of cultures examined was much smaller during April than during some of the winter months. For this period, however, 2042 cultures were examined. Of these, 915 were primary, 944 were secondary, and 183 were trial cultures—that is, were made from the healthy throats of persons who had been in contact with diphtheria. Of the 915 primary cultures about one-half, 450, were made by the attending physicians. The clinical diagnoses accompanying the slips in these cultures were as follows: In 54 cases, false diphtheria (usually tonsillitis); in 145, diphtheria or croup; and in 241 the diagnosis was doubtful or blank. The result of the bacteriological examination was as follows: False diphtheria, 110, in contrast with 54 diagnosticated as such; true diphtheria, 239, in contrast with 145 diagnosticated as such; and 241 in which the diagnosis was doubtful or blank. In 91 cases the bacteriological diagnosis was doubtful, either because the cultures were made too late in the disease, or were contaminated, or were unsatisfactory for some other reason.

It therefore appears that out of 450 primary cultures received from physicians from April 1st to 28th inclusive, only 239, a little more than half, proved to be true diphtheria. During this same period there were reported to the department, as diphtheria, 107 cases in which no cultures were made by the attending physicians, but those later made by the inspectors of the Department, on bacteriological examination showed no diphtheria-bacilli, and the cases were therefore declared to be false diphtheria.

These data dispose of the statement which has been so constantly made and reiterated, that, as the result of the general adoption of bacteriological examinations for the diagnosis of diphtheria, the total number of cases of this disease has been largely increased by the addition of many cases of tonsillitis and pharyngitis which were previously regarded as simple anginas. As will be seen during the period referred to, 107 cases considered as diphtheria and reported as such to the Health Department were excluded from the lists of reported cases of diphtheria by the bacteriological examination. During this same period only eighty cases considered by the physicians to be false diphtheria or of a doubtful nature were found on bacteriological examination to be true diphtheria.

There are no data at hand to show the exact proportion of cases reported as follicular tonsillitis which, on bacteriological examination, prove to be true diphtheria. The proportion, however, is small.

A large number of cultures is sent to the Department in which no clinical diagnosis is given. Some of these prove to be cases of true diphtheria and some false. Whether they present the clinical features of diphtheria, the Department has no means of ascertaining. Comparatively few physicians, however, send cultures from cases showing only the symptoms of follicular tonsillitis unless there are some reasons for suspecting the affection to be of a diphtheritic character.

The observations made on the cases detailed in this paper, while not very numerous, yet when taken in connection with those previously made in the Health Department laboratories, and the observations of Koplik and others, are sufficiently conclusive in showing that when diphtheria-bacilli typical in appearance are found in cultures obtained from cases of simple angina (cases in which there is no membrane), animal-tests, in a large majority of instances, prove that the bacilli are fully virulent. In other words, when morphologically typical diphtheria-bacilli are found in cultures made after the rather rude methods employed in diagnostic work, the result of the examinations may be generally accepted as indicating the existence of virulent diphtheria-bacilli, and the cases are to be regarded as cases of true diphtheria, unless animal-tests have shown the organisms to be non-virulent.

No.	Date.	Physician's diagnosis accompanying cultures.	Result of bacteriological examination.	Result of animal inoculation.	History of the case.	As to infection of others.	How contracted.	Remarks.
1	.....	Follicular tonsillitis.	Typical diphtheria bacilli.	Virulent.	Typical follicular tonsillitis; exudate disappeared in three days.	None.	.....	
2	.....	Follicular tonsillitis.	Typical diphtheria bacilli.	"	Typical follicular tonsillitis; exudate disappeared in three days.	None.	.....	
3	1896 Jan. 7	Diphtheria?	Many suspicious bacilli; a few typical diphtheria bacilli.	"	Clinically an acute pharyngitis; very mild.	2 cases: 1 mild; 1 very mild.	From brother.	No membrane present at any time.
4	" 9	Ulcerative tonsillitis.	Typical diphtheria bacilli.	"	Severe; septic; mixed infection; died.	?	.....	Antitoxin not administered.
5	" 9	Diphtheria?	Typical diphtheria bacilli.	"	Typical follicular tonsillitis, no membrane.	None.	.....	
6	" 13	Membranous tonsillitis.	Typical diphtheria bacilli.	"	Mild; tonsillar membrane, disappearing after three days.	Diphtheria prevailing in the institution.		Inmate of charitable institution; removed to Diphtheria Hospital.
7	" 13	Membranous tonsillitis.	Typical diphtheria bacilli.	"	Mild; tonsillar membrane, disappearing after four days.	Diphtheria prevailing in the institution.		Inmate of charitable institution; removed to Diphtheria Hospital.
8	" 14	Diphtheria?	Many very suspicious bacilli; a few typical diphtheria bacilli.	"	Mild; tonsillar membrane, disappearing after three days.	Diphtheria prevailing in the institution.		Inmate of charitable institution; removed to Diphtheria Hospital.
9	" 16	Diphtheria?	Typical diphtheria bacilli.	"	A typical case of fairly severe true diphtheria.	None.	Not known.	
10	" 16	Tonsillitis.	Typical diphtheria bacilli.	"	Typical case of true diphtheria.	5 cases; the 4th case severe; the other cases mild.	.....	Attending physician habitually marks slips accompanying cultures "tonsillitis."
11	" 18	Tonsillitis.	Typical diphtheria bacilli.	"	Mild, slightly ill; no other particulars could be obtained.	None.	.....	Antitoxin administered twice.
12	" 19	Follicular tonsillitis.	Typical diphtheria bacilli.	"	Clinically follicular tonsillitis; very mild; not confined to bed.	None.	Possibly from case in house.	
13	" 19	Pseudo-diphtheria.	Typical diphtheria bacilli.	"	Mild at first; later clinically true diphtheria with extensive membrane.	None.	.....	Antitoxin administered.
14	" 20	Follicular tonsillitis; possibly diphtheria.	Extremely small diphtheria (?) bacilli.	"	Very mild tonsillitis; no false membrane at any time.	None.	.....	Patient well isolated.
15	" 19	Tonsillitis.	Small, rather atypical bacilli.	Non-virulent.	Mild; "seemed to be tonsillitis clinically."	.....	.....	
16	" 22	Doubtful.	Large, pointed diph.(?) bacilli.	Virulent.	Not obtained.	.....	.....	
17	" 22	Suspected diphtheria.	Very small typical diphtheria bacilli.	"	Severe.	Not known.	Not known.	

18	Jan.	25	Tonsillitis.	A few large, fairly typical bacilli.	Virulent.	A mild typical tonsillitis; not confined to bed; well in five days.	None.	Possibly from child in family.	
19	"	26	Follicular tonsillitis.	Small number of fairly typical bacilli.	"	Mild; course that of a true diphtheria; typical membrane.	None.	.....	
20	"	27	Measles.	Typical diphtheria bacilli.	"	Severe; course that of a true diphtheria; paralysis of lower extremities.	None.	From a case of membranous croup.	
21	"	27	Nasal diphtheria?	Typical diphtheria bacilli.	"	Mild; no constitutional symptoms; nasal diphtheria.	None; no other children in family.	.....	Antitoxin not administered; treated at dispensary during whole illness.
22	"	27	Diphtheria?	Typical diphtheria bacilli.	"	Mild at first, and diagnosis doubtful; became severe; course that of true diphtheria.	None.	.....	Adult; antitoxin administered.
23	"	27	Diphtheria?	Moderate number typical diphtheria bacilli.	"	Mild; course that of a typical acute tonsillitis.	None.	.....	
24	"	28	?	Typical diphtheria bacilli.	"	Mild; course that of a typical tonsillitis.	None.	.....	Antitoxin not administered.
25	"	28	Follicular tonsillitis.	A few fairly typical bacilli.	"	Very mild; clinically follicular tonsillitis; no membrane.	None.	From aunt in same house.	
26	"	30	Diphtheria?	Typical diphtheria bacilli.	"	Mild; tonsillar diphtheria; membrane disappeared after two days.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
27	"	30	Tonsillitis?	Typical diphtheria bacilli.	"	Moderate; no membrane.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
28	"	29	Pseudo-diphtheria.	Typical diphtheria bacilli.	"	Clinically a case of true diphtheria; extensive membrane.	None.	From another case in same family 3 days previous.	
29	"	30	Membranous tonsillitis.	Typical diphtheria bacilli.	"	Moderate severity, tonsillar membrane disappearing after three days.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
30	"	30	Follicular tonsillitis.	Abundant atypical diphtheria bacilli.	"	Mild; typical follicular tonsillitis; no false membrane at any time.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
31	"	30	Follicular tonsillitis.	Typical diphtheria bacilli.	"	Mild; typical follicular tonsillitis at first; tonsillar membrane disappearing after three days.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
32	Feb.	3	Follicular tonsillitis.	Typical diphtheria bacilli.	"	At first typical follicular tonsillitis, but membrane appeared (tonsillar) and persisted for five days.	Diphtheria prevailing in the institution.		Inmate of an institution; removed to Diphtheria Hospital; antitoxin administered.
33	"	6	Follicular tonsillitis.	Typical diphtheria bacilli.	"	Clinically true diphtheria; very severe.	None.	Not known.	Antitoxin not administered.
34	"	11	?	Typical diphtheria bacilli.	"	Mild; typical follicular tonsillitis; croupy and hoarse on third day.	None.	Not known.	Antitoxin not administered.
35	"	11	Non-diphth. tonsillitis.	Typical diphtheria bacilli.	"	Very mild, simple acute pharyngitis; no false membrane.	None.	Not known.	Case recovered in three days.

No.	Date.	Physician's diagnosis accompanying cultures.	Result of bacteriological examination.	Result of animal inoculation.	History of the case.	As to infection of others.	How contracted.	Remarks.
	1896							
36	Feb. 12	Follicular tonsillitis.	A few bacilli, typical in shape; but with even staining.	Virulent.	Course of disease that of a true diphtheria.	.....	.....	
37	" 18	Tonsillitis?	Typical diphtheria bacilli.	Non-virulent.	Clinically an acute tonsillitis, very mild.	Diphtheria prevailing in the institution.		Inmate of an institution.
38	" 18	Tonsillitis?	Typical diphtheria bacilli.	Virulent.	Clinically a case of true diphtheria, mild.	Diphtheria prevailing in the institution.		Inmate of an institution.
39	" 16	Diphtheria?	Typical diphtheria bacilli.	"	Began with convulsions and high fever; at first apparently follicular tonsillitis; later scarlet fever and diphtheria.	None.	None.	
40	" 27	Diphtheria?	Small, but typical diphtheria bacilli.	"	Clinically a very mild case of acute tonsillitis.	Diphtheria prevailing in the institution.		Inmate of an institution.
41	" 27	Diphtheria?	Typical diphtheria bacilli.	"	Not obtained.	Not known.	Not known.	
42	March 4	Pharyngeal diphtheria?	Typical diphtheria bacilli.	"	No information obtainable.	Not known.	Not known.	
43	" 6	Rhinitis and laryngitis.	Typical diphtheria bacilli.	"	No information obtainable.	Not known.	Not known.	Inmate of an institution.
44	" 8	Pseudo-diphtheria.	Typical diphtheria bacilli.	"	Clinically appeared to be a very mild acute pharyngitis; no membrane.	.....	From another case in family.	Except for occurrence of previous case no culture would have been taken.
45	" 11	Acute tonsillitis.	Typical diphtheria bacilli.	"	A moderately severe true diphtheria; extensive membrane.	.....	From another case (memb. croup) in same family, but in another house.	This and succeeding case in same family.
46	" 11	Acute tonsillitis.	A few typical diphtheria bacilli.	"	A moderately severe true diphtheria; extensive membrane.	.....	Same as above.	This and previous case in same family.
47	April 5	Follicular tonsillitis.	Typical diphtheria bacilli.	"	At first follicular tonsillitis, throat had cleared up; then severe croup requiring intubation.	Not known.	Not known.	
48	" 6	Follicular tonsillitis.	Typical diphtheria bacilli.	"	Appeared finally to be a moderately severe case of true diphtheria.	1 case, same family.	Not known.	Antitoxin administered; case recovered.

We may refer, in conclusion, to the following classes of causes:

First. The healthy throats in which diphtheria-bacilli are present. In these cases investigation almost always shows that the individuals have been in contact with cases of diphtheria. The presence of the bacilli in the throat without any lesions does not, of course, indicate the existence of the disease.

Second. The simple anginas in which virulent diphtheria-bacilli are found. These are to be regarded, from a sanitary standpoint, in exactly the same way as cases of true diphtheria.

Third. Cases of true diphtheria presenting the ordinary clinical features of diphtheria and showing the Löffler bacilli.

Fourth. Cases of angina associated with the production of membrane in which no diphtheria-bacilli are found. These might be regarded, from a clinical standpoint, as diphtheria; but bacteriological examination shows that some other organism than the Löffler bacillus is the cause of the process.

It may be urged that the cases described in this paper were possibly instances of streptococcus-inflammation of the throat in which diphtheria-bacilli chanced to be present in the throat-secretions and were only accidental accompaniments and not the cause of the inflammation.

This inference does not appear to be justified, and the only excuse for it would seem to be the desire to retain the anatomical conception of diphtheria—*i. e.*, that it is always an inflammation associated with the formation of a false membrane. It is this conception which I particularly wish to combat, and I desire especially to emphasize the statement that all inflammations of mucous membranes due wholly or in part to the Klebs-Löffler bacillus should be included under the name diphtheria without reference to the site or extent or intensity of the inflammatory process or the character of the exudate.

SUBPLEURAL PULMONARY ABSCESS,

WITH REPORT OF CASES.

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No disease of the lungs presents more difficulties to the student than abscess, not only on account of its rarity and of the uncertainties of diagnosis, but also because the various forms of abscess not being clearly discriminated from one another, there is an apparent discordance between the observations of the pathologist and of the clinician. The former finds what seems irreparable destruction of pulmonary tissue at the autopsy. The latter reports cases of large abscesses which terminate

in quick recovery. Hence according to their standpoint, leading authorities differ widely as to the frequency and prognosis of pulmonary abscess. The diagnosis in cases which recover is often involved in doubt, and the disease when present not rarely fails of recognition. It is thought to be important to report all observations, however imperfect, which can throw any light upon this subject. I have endeavored, as far as possible, to base my conclusions upon objectively determined facts rather than upon my interpretation of physical signs. Whether or not the views advanced meet with acceptance, it is hoped that they may at least serve as a stimulus to further study of this obscure subject.

Case I.—Sergeant S., of the 8th U. S. Infantry, a man twenty-six years of age, and of good previous health, was treated for several days in the post-hospital of Fort McKinney, Wyoming, for a bronchial catarrh of moderate severity, a mild form of influenza prevailing at the time, and was returned to duty before he had completely recovered, but at his own request, on November 24, 1891. He was seized with severe and repeated chills during the afternoon of the same day, and was readmitted to the hospital in the evening. The patient's temperature was unusually slow in rising. Otherwise the disease pursued, apparently, the usual course of acute croupous pneumonia, the left lower lobe being the part of the lung affected. The pulse was from the beginning so small, feeble, and irregular that an unfavorable issue was anticipated. A supporting treatment was instituted and alcoholic stimulants with ammonium carbonate were given from an early period. On December 1st the patient's condition was such that it was hardly expected that he would survive twenty-four hours, but very free stimulation and hypodermatic injections of strychnine carried him through the night. During the following days there was a slight improvement in the breathing, pulse, and temperature, but the patient developed a most troublesome cough, attended by no characteristic expectoration and evidently of a reflex nature. He was unable to turn upon either side without aggravating the paroxysms of coughing to an alarming degree. The urine was highly albuminous. An evening rise of temperature of one or two degrees began to declare itself, accompanied by exhausting sweats. Physical examination of the left side of the chest on December 17th showed vesiculo-tympanitic resonance and broncho-vesicular breathing anteriorly. In the axilla there was flatness on percussion with absence of breath-sounds and of vocal fremitus. The heart was thought to be slightly displaced to the right. Although it was impossible to examine the back, it was decided that there was sufficient evidence of the presence of empyema to warrant an exploratory puncture. Aspiration was accordingly performed, the needle being inserted in the sixth intercostal space in the mid-axillary line. A thin, odorless pus began to flow when the needle had penetrated about three-fourths of an inch, and twenty-three ounces were withdrawn. On the following day a second aspiration removed twenty-five ounces of pus. The diagnosis of empyema having been made, as it was supposed, the question of further operative interference presented itself. After consultation with my colleague, Assistant Surgeon H. A. Shaw, U. S. Army, the immediate performance of pleurotomy was decided upon.

On December 22d, a small quantity of pus having been obtained by

aspiration at the same depth as in the previous operations, Dr. Shaw plunged a sharpened director through the sixth intercostal space in the mid-axillary line, the parts having been made anæsthetic by cocaine, and, passing a bistoury along it, rapidly made an incision two inches in length. Instead of the flow of pus which was expected, there was only a slight oozing of frothy blood from the wound. The sun shone brightly upon the wound, and looking through it into the chest we saw that the pleural cavity was absolutely empty. The lung, which was covered with a smooth coat of fibrin, was retracted laterally, but not vertically, the weight of the abscess no doubt preventing retraction upward. An aspirator-needle passed through the wound and into the lung reached pus as soon as the pulmonary pleura had been penetrated.[1] In doing this the whole length of the needle and a small portion of the attached rubber-tubing were introduced into the cavity of the chest, showing a lateral retraction of the lung of about four inches. The patient appeared slightly, if at all, affected by the collapse of the lung. A large antiseptic dressing was applied to the wound, which healed without suppuration in a few days, after which the pneumothorax soon disappeared.

During the following month the patient's temperature ranged between 98° and 101°, with oscillations of about one degree between the morning and evening temperatures. The pulse-rate was constantly above 100, and the respirations fell from an average of 30 in the first part to an average of 20 in the latter part of the month. The cough continued to be harassing, and the patient became much emaciated. The albumin had gradually disappeared from the urine. During the last days of January the range of temperature and the rate of respiration increasing, it was decided to resume the aspirations. (Chart I.)

On February 1st pus to the amount of 12 ounces was withdrawn at the same point and from the same depth as previously. The aspirations were continued as follows: February 2d, 15 ounces; February 3d, 14 ounces; February 4th, 14½ ounces; February 5th, 14 ounces; February 6th, 13 ounces; February 7th, 16 ounces; February 8th, 13½ ounces; February 9th, 2½ ounces, the total amount withdrawn in this series of aspirations being 114½ ounces. The patient's sensations served in general as the guide as to the time when the aspirations should be stopped, but on February 8th the aspiration was continued until the needle failed to draw and the pus was noticeably thinner. On the following day but 2½ ounces of a sero-pus could be obtained, and the abscess-cavity was thought to have been emptied. On February 22d the aspirations were again resumed and pus to the amount of 15, 15, 12, and 4½ ounces was removed on successive days, the pus of the last aspiration being again thinner and mixed with serum. It was then decided to test the effect of a repeated emptying of the sac, and the aspirations were continued four days longer, until February 29th. Three ounces of a cloudy serum were obtained at each of these operations. The patient now began to improve rapidly in health, and his cough had become much less troublesome. After February 29th his pulse, respiration, and temperature became practically normal. (Chart II.)

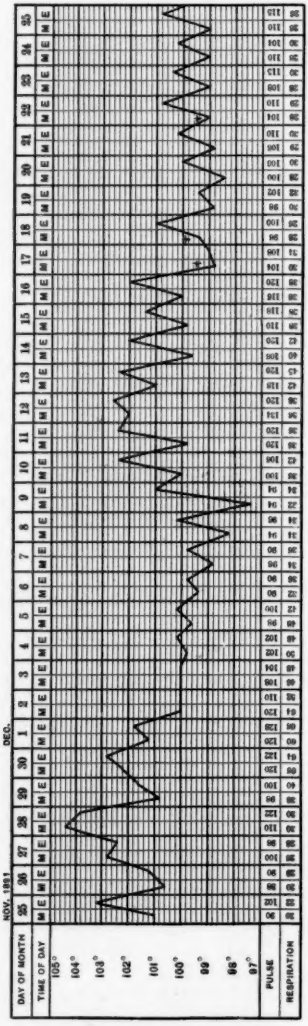
On March 7th he weighed 112¾ pounds, his normal weight being about 150 pounds. On the 22d of that month his weight was 122 pounds, and

[1] The needle having an eye one-third of an inch from the tip, it was impossible to determine, by noting the depth at which pus began to flow, the thickness of the intervening tissues if under half an inch.

on April 11th 127 pounds; but although the general improvement was marked the suppurative process was not arrested.

On March 13th 6½ ounces of pus were aspirated from the abscess, and 6 to 6½ ounces on each of the three following days. These aspirations did

CHART I.



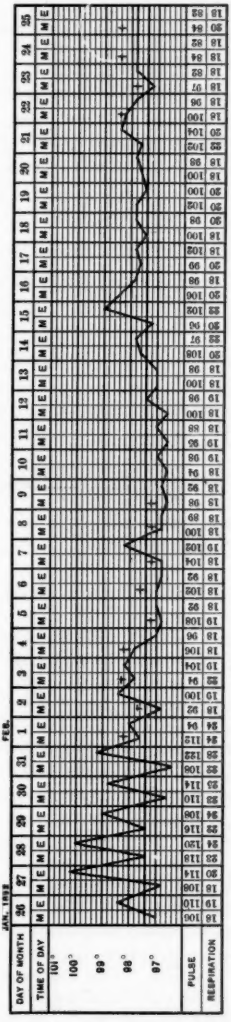
The first month.

December 17. Aspiration . . . . . 23 ounces pus.
" 18. " . . . . . 25 " "
" 22. Pleurotomy.

not empty the sac, but the patient now seemed unable to tolerate the withdrawal of large amounts, and the use of the aspirator was henceforth

discontinued. During the following month the temperature at no time exceeded 99°, the pulse and respirations were normal, and the patient continued to gain in strength. During the night of April 25th

CHART II.



The second and part of the third series of aspirations.

Second series.

February 1.	Aspiration	12 ounces.
" 2.	"	15 "
" 3.	"	14 "
" 4.	"	14½ "
" 5.	"	14 "
" 6.	"	13 "
" 7.	"	16 "
" 8.	"	13½ "
" 9.	"	2½ "
		114½ ounces.

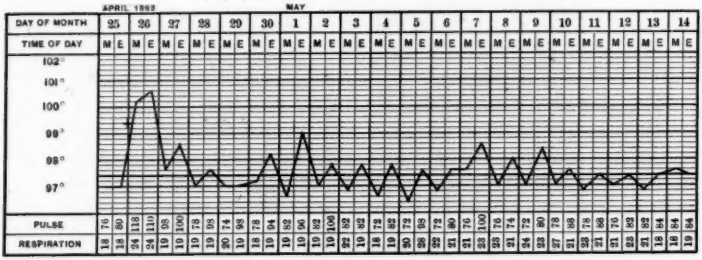
Third series.

February 22.	Aspiration	15 ounces pus.
" 23.	"	15 " "
" 24.	"	12 " "
" 25.	"	4½ " "
		46½ ounces.

the abscess burst into a bronchial tube. There was a profuse purulent expectoration, some rise in temperature, and an increase in the rapidity of the pulse and of the respiration. The well-marked dulness

which had been present over the left lower lobe in the back and the axilla still continued. (Chart III.) Loud moist râles were heard over the back, but definite signs of a cavity were not detected. The slight broncho-pneumonia caused by the rupture led to greater oscillations of temperature during the month of May, and the cough was annoying; but on the whole there was a steady gain. In June the temperature was normal, the expectoration had become insignificant, and the patient was nearly well. On June 22d he was dismissed from the hospital and put upon light duty, and soon afterward was dropped from the sick-report as cured. His term of enlistment expiring in the autumn of that year, he passed successfully the physical examination for re-enlistment, the only defect observed being a slight loss of expansibility of the left side of the chest.

CHART 3.


APRIL 1892
MAY
DAY OF MONTH
25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14
TIME OF DAY
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
102°
101°
100°
99°
98°
97°
PULSE
RESPIRATION

Rupture of the abscess.

\+ Abscess ruptured into bronchus during the night.

CASE II.—The patient, a large and powerful man, about thirty-five years of age, was seen in consultation with Dr. J. H. Lott, of Buffalo, Wyoming, in February, 1892. He had been ill with pneumonia of the lower lobe of the left lung for several days, and shortly before my visit a consolidation of the lower lobe of the right lung had also manifested itself. He recovered from the double pneumonia, but did not regain his strength. He was seen again in consultation with Dr. Lott on April 22, 1892. At that time he was weak and emaciated, suffered from an obstinate cough with mucous expectoration, and from fever and sweats. On physical examination the right lung was found to be normal, except that the breath-sounds were somewhat exaggerated. On the left side of the chest the respiration was somewhat harsh. Percussion showed marked dulness, almost flatness, over an area below the left scapula about the size of the palm of the hand, at which point there was also a diminished transmission of breath-sounds, voice, and fremitus. The patient's symptoms pointing clearly to the presence of pus, an exploratory aspiration was made on April 25th at a point an inch below the angle of the left scapula in the centre of the region of dulness. Pus was encountered at the depth of about an inch, and 16 ounces were withdrawn. The aspirations were repeated on April 28th, May 2d, 4th, and 7th, the amounts removed at each operation ranging between 12 and 16 ounces. It was supposed that it would be necessary to continue the aspirations, but the patient improved so rapidly in health that I was not called in again.

In about three weeks after the last aspiration the patient's attending physician informed me that the abscess had ruptured into the bronchi. After this event convalescence was rapid and uneventful, and the patient soon regained his former robust health.

As has been already remarked, writers differ greatly as to the frequency of pulmonary abscess. Leyden,[1] for example, is of the opinion that it occurs more frequently in private practice than is commonly supposed.

Sée[2] says that it is an affection so rare that the thought of it need hardly embarrass the clinician in the diagnosis of other conditions, and will concede that a case is one of pulmonary abscess only when the autopsy shows a collection of pus in a focus of gray hepatization.

Laennec[3] states that abscess follows pneumonia with varying frequency, and says that in the year 1823 he met with more than twenty cases of abscess following pneumonia, in two of which the diagnosis was confirmed by autopsy, while the remainder, some of which were evidently of considerable extent, recovered completely within a period of fifteen to forty days, a statement which has been received with much skepticism by Laennec's editors and other subsequent writers. Their difficulty appears to be to reconcile such favorable results with the presence of lesions at all comparable with those found in fatal cases of abscess; but they might well be challenged to name the disease which, presenting the signs of a pulmonary cavity and being attended presumably by profuse purulent expectoration, could terminate in quick recovery. If with Sée we say that it was localized empyema, we simply solve one difficulty by creating another, for such rapidity of cure without operation in a series of empyemata is certainly unprecedented. These critics commit the error of assuming that there is but one kind of pulmonary abscess. The objections to the diagnosis of pulmonary abscess in cases which recover, so far as they are based upon the supposition that an extensive loss of lung-substance is the inevitable result of the formation of an abscess, lose their force if we shall succeed in demonstrating that a large abscess may exist within the lung without causing any considerable destruction of the pulmonary vesicles and under conditions which are as favorable for complete cure as can occur in empyema.

Every collection of pus within the lung is a pulmonary abscess in the widest sense of the term. Excluding the usually small and multiple abscesses of general infectious disease, we will consider only that class of abscesses, of relatively large size and generally single, in which the local suppuration within the pulmonary tissue constitutes the chief or only morbid condition present. Abscesses of the lung are divided clinically into two kinds: the open or discharging abscess, and the closed abscess.

[1] Volkmann's Sammlung kl. Vorträge, Nos. 114 and 115.
[2] Diseases of the Lungs, pp. 110, 302. [3] Traité de l'Auscultation Médiate.

The open abscess is in communication from the first, or from a very early period, with the bronchi. The closed abscess has no communication with the bronchi for a period of weeks or even months, until it finally ruptures with a profuse discharge of pus. The open abscess occurs as a sequel of pneumonia, gangrene, bronchiectatic ulceration, and bronchopneumonia from the aspiration of infectious matters. It most frequently follows pneumonia. Leyden thinks that abscess is not a direct sequel of pneumonia, but is preceded by gangrene; the view which was formerly held, and which is still taught, that the post-pneumonic abscess is the result of a purulent infiltration and subsequent diffluence of the pulmonary cells, being, in his opinion, less probably correct. Ziegler recognizes suppuration as a rare issue of pneumonia, but says that large abscesses are extremely rare, and are probably formed only when some previous morbid alteration, sometimes patches of necrosis, has already existed. If these views be accepted, gangrene must be regarded as by far the most common cause of the open abscess. The two diseases shade into each other, the so-called abscess generally representing merely cases of gangrene in which the amount of necrosed tissue is relatively small. English writers call all abscesses of the lungs not due to tubercle or bronchiectasis gangrenous abscesses.[1]

The pus of these abscesses is in contact with the air through the open bronchi. It rapidly undergoes putrefactive changes and acquires, if it has not from the first possessed, corrosive properties. The abscess extends by ulceration and destruction of the contiguous lung-tissues. A fetid, sometimes thick and scanty, sometimes abundant and frothy, sputum is generally the first evidence of the existence of such an abscess. This expectoration, of course, does not necessarily appear at the beginning of the illness, but there is no extensive accumulation of pus previous to discharge. Since the open abscess is generally secondary to gangrene, the living air-cells undergoing destructive purulent inflammation only when the infection is primarily virulent or has become so because of the pabulum afforded to septic organisms by dead tissue or stagnant fluids, it is evident that the seat of true abscess of the lung must be sought elsewhere than in the air-cells.

Fischl[2] defines a genuine pulmonary abscess to be "an acute or subacute abscess which, not being preceded by other disease of the lungs, forms in the interalveolar connective tissue precisely as suppurative inflammations develop in the connective tissue of other organs," a definition which would be improved by the omission of the clause which excludes antecedent disease of the lungs, for this abscess, except when due to septic embolism, is probably always preceded by some form of pulmonary inflammation.

[1] Godlee: Lancet, 1887, vol. i. p. 457.

[2] Wien. med. Presse, vol. xxvii. p. 1585.

Stokes's[1] case is the first one on record of unmistakable abscess of the pulmonary connective tissue, and his description is still unsurpassed as a picture of the fully developed disease. In this case, in which the abscess followed acute pneumonia, "the lower lobe was a bag of matter, the yellow color of which was seen plainly through the pulmonary pleura. This being opened displayed the substance of the lower lobe completely dissected from its pleura by the suppurative inflammation of the subserous cellular membrane. This process was also found to have invaded extensively the interlobular and intervesicular cellular tissue, so as to cause this part of the lung to represent nearly the structure of a bunch of grapes. All these nearly isolated lobules were surrounded by puriform matter, in which they hung from their bronchial pedicles. There was no air in the cavity thus formed within the pleura yet external to the lung, nor could I find any evidence of any bronchus communicating with it." Under the name of dissecting-pneumonia the disease has been described by many authors. Rindfleisch[2] thus defines it: "Dissecting-pneumonia is a suppurative inflammation or a purulent destruction of the partitions of connective tissue which unite the principal lobular divisions of the lung. When the suppuration has destroyed these partitions the pulmonary lobules are necessarily separated into smaller segments, whence comes the name of the disease. It is easily determined by simple inspection that the inflammation is propagated by way of the lymphatics, which, starting from the surface of the pleura, pass to the root of the lung through these partitions of connective tissue. These vessels, filled with and surrounded by pus, are seen to form varicose cords of a yellowish-white which traverse the walls of the already separated pulmonary lobules. The lobules may be more or less dissected, but generally death occurs so quickly that the separation is only partially effected or is even only indicated."

Hutinel and Proust[3] describe, in addition to the subpleural form already mentioned, a dissecting-peribronchitis which originates as a peribronchial lymphangitis and extends peripherally. In these abscesses there is extensive destruction of air-cells, and the denuded bronchi and bloodvessels hang free in the abscess-cavity. The peribronchial abscess appears to rupture at an earlier period than the subpleural variety. In one of Hutinel and Proust's cases rupture took place on the nineteenth and death on the twenty-fourth day. In another rupture occurred on the fourteenth and death on the twenty-second day. Ziegler,[4] treating of the subpleural lymphangitis, says that "the inflammation may spread from the interlobular to affect the peribronchial lymphatics. The lobules

[1] Diseases of the Chest, New Sydenham Society, 1882, pp. 124, 125.
[2] Lehrbuch der Path. Gewebelehre.
[3] Etude sur la Pneumonie Disséquante. Archives gén. de Méd., 1882, p. 532.
[4] Text-book of Pathological Anatomy, Am. ed., vol. iii. p. 156.

may also become inflamed, so that the already compressed lung-tissue becomes the seat of inflammatory exudation and infiltration, and the appearance of the lung is like that of an ox dead of pleuro-pneumonia. If the disease is not fatal, recovery takes place by resorption. Should residues of inspissated pus remain in the thickened septa, nodules having much resemblance to gummata are formed."

The subpleural abscess, with which we are especially concerned, is described by the authors above quoted as a complication of empyema. Indeed, Ziegler's name for the disease is pleurogenous pneumonia. Subpleural lymphangitis may, however, occur independently of suppuration of the pleural cavity. Recent bacteriological investigations have shown that micro-organisms are found in the lung-structures, the lymph-spaces of the pleura, and upon the pleura itself when the lungs are the seat of bronchitis, broncho-pneumonia, and lobar pneumonia;[1] that pulmonary inflammation is always accompanied by micro-organisms, and may be regarded as directly dependent upon their action; that several species of bacteria may be found in the lung at the same time, all concerned in the inflammatory process; and that solution of continuity in the mucous membrane of the respiratory tract is a necessary antecedent to infection.[2] The non-pleurogenous subpleural abscess may, therefore, be regarded as due to infection of the subpleural lymphatics by micro-organisms which reach these vessels by the way of the inflamed air-passages. The affection generally follows pneumonia, probably as the result of a mixed infection. Subpleural lymphangitis doubtless leads more commonly to a pleuritis. In cases in which the pleural cavity is not directly affected we may argue a less severe form of infection. The prognosis of the subpleural abscess is, of course, better in cases in which a complicating empyema is absent, which may account for the fact that in its uncomplicated form the disease is so rarely found at autopsies.

The pathology and pathological anatomy of dissecting-pneumonia are thus pretty well established; but on the clinical aspect all is uncertainty. Hutinel and Proust, raising the question whether such abscesses are susceptible of cure, are unable to answer it further than to say that cases have been reported which present the closest analogies to those which they themselves have seen, and which have terminated in complete recovery. They add that it doubtless will be long before it can be proved that such cases are curable, because of the difficulty of affirming their existence during life. Ziegler, as we have seen, recognized two terminations of subpleural lymphangitis—death and cure by resorption; but if there is not a third termination of the developed abscess, viz., by ulceration and rupture, these abscesses must differ in an inexplicable way from

[1] Koplik: Am. Text-book Diseases of Children, p. 910.
[2] Herrick: Supplement. Ref. Handbook of the Medical Sciences, p. 576.

other abscesses of the connective tissue. In the closed abscess the delay in the expectoration and the nature of the pus discharged would seem to be proofs that the pus has collected in a location where it has been from the first completely excluded from the air—*i. e.*, in all probability in the connective tissue.

Both Leyden and Hutinel and Proust express the opinion that suppuration of the pulmonary connective tissue is the cause of the majority of cases of pulmonary abscess; but facts have been wanting which should positively connect the pathological findings in fatal cases of dissecting-pneumonia with the clinical course of closed abscesses which end in recovery. Since so far as I have been able to learn, my first case is the only case of subpleural abscess in which the diagnosis has been made during life, it is of sufficient importance to warrant a brief discussion of its more significant features and of the reasons for that diagnosis, by which it is hoped that some light may be thrown upon the nature of closed abscesses of the lung in general.

Referring to the record, we notice that the temperature during the first seven days of illness, while not typical of croupous pneumonia, is certainly not incompatible with that diagnosis. The physical signs and the clinical course of the disease in my opinion fully warranted the diagnosis of acute croupous pneumonia of a somewhat adynamic type. A second period, marked by a remission of the fever and a temporary improvement in the pulse and respiration, is succeeded by a third period, in which the increasing oscillations of temperature are suggestive of suppuration; but the continued high pulse- and respiration-rates after the first fall in temperature make it seem probable that the disease originated primarily from a mixed infection, and that the suppurative process was well under way before the pneumonia began to resolve. In two aspirations, on December 17th and 18th, 48 ounces of pus were withdrawn. The second series of aspirations, from February 1st to 9th inclusive, removed 114½ ounces. In a third series of aspirations, February 22d to 25th, 46½ ounces were removed. Continuing the aspirations for four days longer, 3 ounces of a cloudy serum were obtained at each operation. The fact that serum took the place of the pus leads to the following conclusions: The third series of aspirations emptied the sac; the second series having been made at the same point, must also have emptied the sac; the abscess having refilled with serum, not pus, the daily secretion of pus at that time was less than three ounces. Making due allowance, therefore, for the secretion of pus during the time occupied by the second series, we infer that the actual capacity of the abscess was a little more than 90 ounces.

Ascent of the diaphragm and expansion of the right lung may be assumed to have borne a part, although doubtless a relatively insignificant one, in filling the vacuum left by the evacuation of the pus; but a

very considerable proportion of the space occupied by this enormous abscess must certainly have been filled by the expansion of the left lung. Bearing in mind the fact that unduly rapid aspiration of pleural exudates is followed by grave circulatory disturbances, although in this case the lung is simply re-expanding to its normal size, we may infer that the patient could not have tolerated the aspirations if they had induced an extensive and acute overdistention of the neighboring healthy lung, and that therefore the vacuum must have been filled in great part by a re-expansion of collapsed lobules. As a matter of fact, the aspirations were well borne and no alarming symptoms were ever produced by them; but the patient complained more of a vague discomfort and of a sensation of stretching during those aspirations which completely emptied the abscess than during the earlier use of the aspirator. The fact that three ounces of serum were invariably found present after the abscess had been emptied of pus shows that there was a small portion of the original abscess-cavity, representing probably the amount of lung-tissue destroyed by the suppurative process, which could not be refilled by the normal re-expansion of the lung. When this space was emptied the abscess-walls were collapsed by atmospheric pressure, but at the expense of an overdistention of the neighboring lung with air and blood. The *hyperæmia ex vacuo* led to the effusion of sufficient serum to restore the balance of atmospheric pressure. The aspirations thus afford us a means of estimating in a rough way the ratio which the processes of destruction and of collapse of lung-tissue bore to one another in the formation of the abscess-cavity, and show that collapse was by far the more important.

If, in accordance with the prevalent teachings, we suppose this abscess to have originated in a suppuration of the pulmonary air-cells, there are two hypotheses which may be advanced to explain its growth. First, that the space for the abscess was gained chiefly by destruction of the affected tissues. This hypothesis is negatived by the results of the aspirations already discussed, and also by the termination of the case. The patient could not have recovered as perfectly as he did if a large part of the left lung had been destroyed. The second hypothesis is that the abscess began as a localized process, and grew chiefly by compression of the surrounding lung. A localized collection of fluid, if it increases very slowly, may be supposed to cause a consolidation and a pressure-atrophy of the immediately surrounding lung, the tissues thus accommodating themselves to the gradual increase in the size of the sac, so that the tension of its contents, while probably always positive, is not great; but if the accumulation of fluid is rapid in its increase, the elastic resistance of the pulmonary tissues must necessarily create a considerable tension within the sac. This process is illustrated in hydatid cysts of the lungs, in which it is found that the contents of the young cysts are under sufficient pressure to escape freely through a small trocar

without the need of aspiration.[1] In so large an abscess and one which at first grew so rapidly as the one now under consideration, if it originated as a local process and gained space for itself by compression rather than destruction of the surrounding lung, the tension must have been very great; but it needs no argument to prove that high tension could not have characterized an abscess which existed for months without rupture, and of which one wall was formed by the pulmonary pleura. The vitality of the pleura is remarkable under any hypothesis; but it would seem impossible that so delicate a membrane isolated, or nearly isolated, from other living tissues, and bathed with pus over so great an extent of surface, could escape necrosis if it were subjected at an early period to any considerable tension. And in this case, as it happens, we cannot escape from this conclusion by the assumption that the pulmonary was supported and nourished by means of adhesions to the thoracic pleura, at least in the early stages of the abscess; for it will be remembered that forty-eight ounces of pus—a larger amount than Trousseau thought a pulmonary abscess could contain—were withdrawn on December 17 and 18, 1891, leaving a considerable amount of pus within the abscess-cavity, and that the operation on December 22d demonstrated that no adhesions were at that time present. If we suppose the abscess to have originated within the air-cells, in addition to the difficulty of explaining the absence of high tension or of extensive destruction of the lung, there is the equally great difficulty of accounting for the fact that the abscess remained closed for so long a time. It is doubtless true that the smaller bronchi are often occluded by inflammatory processes or by an inspissated secretion; but it appears highly improbable that all the bronchi communicating with the large affected area could be so firmly closed as to be absolutely impervious for weeks to quarts of a thin and homogeneous pus.

The only way in which, with due regard to all the facts, we can conceive of the development of the abscess to such large dimensions is by supposing it to have been a subpleural abscess, the result of a dissecting-pneumonia. In this disease, the connective tissue being first dissolved by the suppuration, the pulmonary lobules are left free in the cavity of the abscess, and retract by virtue of their elasticity as the pus collects. *The same process occurs in each isolated lobule which takes place in the lung as a whole in the presence of a pleural effusion.* Pus can, therefore, accumulate without producing positive tension until the space which the suppurative process thus provides for itself is exhausted—*i. e.*, until the destruction of the connective tissue has ceased and the abscess has become limited. Positive tension, then, is a late phenomenon in these abscesses as it is in pleural effusions.

[1] Dungan Bird, quoted by Sée: Diseases of Lungs, p. 304.

All large closed pulmonary abscesses which terminate favorably are probably subpleural abscesses; for the theory that the abscess occupies space gained by collapse rather than destruction of pulmonary lobules is the only one which can reconcile the two apparently contradictory facts: First, the presence of a large amount of pus; second, a recovery so complete as to prove that no great destruction of pulmonary tissue could have occurred.

It is instructive to contrast my first case as an example of subpleural abscess with the cases of dissecting-peribronchitis described by Hutinel and Proust. In these cases the suppuration began around the bronchi and extended peripherally through the lobules. The abscesses must have been under a positive tension from the first. The destruction of tissue was great, and rupture took place at an early period. The prognosis of a large abscess can only be good when it develops beneath the pleura, so that the destructive effects upon the pulmonary tissues of pus confined within them under a positive tension are avoided.

The diagnosis of pulmonary abscess, according to Juergensen,[1] can be made only when the abscess has burst and left a large cavity, filled with air, communicating with a bronchus and situated near the surface; but in the large superficial abscess, with which we are especially concerned, the presence of pus before rupture is easily ascertained by exploratory puncture, and the determination of its location with respect to the pulmonary pleura is the important question. The diagnosis by means of physical signs between encysted empyema and subpleural pulmonary abscess is impossible both before and after rupture, for the intervention of a thin membrane like the pulmonary pleura between the abscess and the chest-wall cannot change the percussion-note nor the auscultatory phenomena. Change in the location of the dulness with the varying position of the patient, if detected, does not exclude abscess. Holt[2] reports a case of closed pulmonary abscess simulating empyema, in which the line of flatness changed with the patient's position.

Fenger and Hollister[3] give the history of a case of abscess caused by suppuration of a hydatid cyst, in which the percussion-note of the anterior chest was dull when the patient was erect, but became tympanitic when he lay upon his back.

When the abscess has discharged by rupture into the bronchi we may have signs from a pulmonary cavity which are not distinguishable from those of pyopneumothorax. Metallic sounds on percussion and the succussion-sounds may be found in large pulmonary cavities.[4] The "cracked-pot" sound is sometimes heard in pyopneumothorax.[5] Nor are the

[1] Ziemssen's Cyclopædia, vol. v. p. 126.
[2] New York Medical Record, April 16, 1887.
[3] American Journal of the Medical Sciences, October, 1881, p. 378.
[4] Fraentzel: Ziemssen's Cyclopædia, vol. iv. pp. 763, 764. [5] Ibid., p. 761.

symptoms more distinctive. For example, the most striking symptom in the early course of my first case was the terrible paroxysms of coughing produced when the patient attempted to turn upon his side; but Fraentzel[1] remarks that cough brought on by every change of position is one of the characteristic symptoms of large effusions into the pleura, and frequently induces the experienced physician to suspect with probability the existence of such an effusion even before he has made a physical examination.

Trousseau[2] says that the time at which the abscess ruptures is the most important point in the differential diagnosis of pulmonary abscess from empyema; that it is impossible for a pulmonary vomica to pass the twentieth to the twenty-fifth day without opening into the bronchi; whereas a pleural abscess breaks through the lung not earlier than the fortieth day. He also remarks that the quantity of pus evacuated is significant; that an abscess of the lung cannot contain more than a litre, while the pleural abscess may contain two, three, or even four litres. The history of my first case, in which the abscess contained about three litres of pus and in which a period of forty-four days (December 18, 1891, to February 1, 1892) intervened between the first and second series of aspirations, and forty days again between the last aspiration and the rupture, shows well the futility of attempting to fix arbitrary limits of space and time for these abscesses.

The presence of elastic fibres of lung-tissue in the expectoration, as determined by microscopic examination, is an evidence of destructive suppuration of the lung. The fibres are very numerous in the pus from pulmonary abscesses; but since the process of perforation from the pleural cavity into the bronchi is necessarily attended by more or less inflammation and destruction of the lung-tissue, these fibres might also be detected in the pus expectorated from an empyema. A probable diagnosis could, however, be made between the two affections from the relative number of fibres present.

But it is especially desirable to distinguish subpleural abscess from empyema before rupture, not only for the purposes of treatment, but also to avoid the blunder of performing an unnecessary or premature pleurotomy upon such an abscess under the supposition that it is an empyema. Here a positive diagnosis may be reached, it is thought, by the microscopic examination of the *aspirated* pus, for in the commoner form of empyema due to infection of the pleural cavity by way of the lymphatics the lung-tissues previous to rupture are intact, and elastic fibres are, of course, absent from the pus, whereas they are probably abundant in the pus of the subpleural abscess. The only cases in which doubt could arise are the rare forms of empyema caused by the rupture

[1] Ziemssen's Cyclopædia, vol. iv. p. 633. [2] Quoted by Leyden, op. cit.

of simple tuberculous or gangrenous abscesses of the lungs into the pleural cavity, in which the presence of elastic fibres in the pus is possible. Here, too, a probable diagnosis could be established from the relative number of fibres present, as well as from the history of the case.

Encysted empyema is limited by adhesions which are either true cicatricial adhesions from previous disease, or, if due to the inflammation which causes the pus, in the early stages of the abscess amount simply to an agglutination of the opposed pleural surfaces by the effused fibrin. Such adhesions must be too weak to resist any considerable tension; but in encysted empyema the adhesions necessarily prevent in great measure the retraction which occurs in a general pleuritis as the result of effusion. Hence, if pus is abundantly formed, the tension of the abscess must quickly become positive. If then in a supposed localized empyema early aspiration shows the quantity of pus present to be relatively great, the area of dulness being distinctly limited, especially if, as in my second case, the limit of the lateral extension can be plainly made out,—if we adhere to the diagnosis of empyema, we can only account for the failure of the pus to burst through its barriers and produce a general empyema by the rather improbable assumption that lines of impervious cicatricial adhesions enclosing a portion of non-adherent pleura were present before the abscess developed. If such an abscess terminates in rapid recovery after a free rupture into the bronchi, the favorable issue tends to establish more positively the diagnosis of pulmonary abscess rather than of empyema. For the prognosis of empyema after rupture into the lung is only good, according to Traube and Fraentzel,[1] in case the pus is discharged slowly under the pressure of cough through the meshes of the alveolar tissue in such a way that the production of pyopneumothorax is prevented. The question as to the prognosis of empyema, and especially of encysted empyema, requires further investigation, for it is probable that the confusion of cases of subpleural abscess with empyema has caused the prognosis of the latter disease to be regarded as more favorable than it really is. If we admit the possibility of the individual retraction and expansion of lobules in subpleural abscess, there is, at all events, no necessity of resorting to the diagnosis of empyema in order to account for the fact of cure of an intrathoracic abscess. On the contrary, it is evident that the advantage with respect to expansibility of the lung is likely to lie upon the side of the subpleural abscess. It unfortunately did not occur to me to examine microscopically the aspirated pus in my second case; but for the reasons above presented it appears to me that it should be regarded as a subpleural abscess rather than an encysted empyema.

If the patient attacked by a dissecting-pneumonia survives until a

[1] Op. cit., pp. 619, 683.

subpleural abscess has developed, the chief dangers which threaten him are: death from exhaustion and sepsis previous to rupture; death from suffocation during rupture or as a result of broncho-pneumonia due to the aspiration of pus into other parts of the lung; failure of the abscess-cavity to contract and heal, whether the result of insufficient opening, or more probably because of destruction of tissue and impermeability to air of the surrounding lung; rupture into the pleural cavity with the production of empyema. The corresponding indications for treatment are: first, to lessen septic absorption and improve the patient's health; second, to diminish the size of the abscess permanently; third, to re-expand the collapsed lobules; fourth, to favor rupture into the bronchi. It can, I think, be shown that repeated aspirations fulfil to a certain extent all these indications. Inspection of the temperature-chart of the first case shows clearly the benefit to the pulse, respiration, and temperature which was derived from the aspirations, especially those which completely emptied the abscess. And the ground thus gained was not all lost when the abscess refilled. The patient continued to improve in strength and gain in weight even at times, as in the month of April, when no aspirations were performed and the abscess was doubtless increasing in size. In the second case the improvement in the general condition of the patient after the aspirations was even more marked. The explanation of these clinical facts undoubtedly is that the removal of the pus stopped for the time the absorption of toxic substances, the patient's general health was thereby improved and his powers of resistance increased so that destructive ulceration was checked; the abscess-walls were thickened by the growth of inflammatory tissue, and their absorptivity became permanently diminished. With regard to the second indication, the rapidity with which the abscess of the first case was emptied or nearly emptied after rupture pointed to a free opening. The amount of pus expectorated was not measured; but there seemed no doubt that the quantity was much less than the ninety ounces which we suppose to have been at one time approximately the capacity of the abscess—an amount which, if suddenly discharged, would probably have suffocated the patient, or at best have caused a severe broncho-pneumonia. Permanent diminution in the size of the abscess is to be expected if it is emptied while granulation is actively progressing in its walls; for the pus being removed the collapsed lobules re-expand, obliterating the upward interlobular prolongations of the cavity, and, being in contact with each other, they readily reunite. In so far as they are firmly reconnected, their individual retractility is lost, and they cannot again collapse except under positive pressure. At the same time the secreting-surface of the abscess is greatly diminished. The third indication, the re-expansion of collapsed lobules, is necessarily met by aspiration, as we have seen. The importance of re-expanding

these lobules before they have become fastened down, as it were, in their position of retraction by the formation of connective tissue during the processes of repair is evident. The fourth indication, to favor rupture into the bronchi, can be met only indirectly by aspiration, in so far as that operation delays the time of rupture. When the abscess has become localized its walls are gradually strengthened and stiffened by the development of fibrous tissue. A continuance of the process by which space was provided during the first stage—*i. e.*, isolation and collapse of pulmonary lobules—is no longer possible, and increase in the contents of the abscess causes a heightened tension. The bronchial tubes which lie within the cavity and have been stripped of their connective tissue and bathed in pus undergo a process of inflammatory softening; but the processes of repair being much slower and more imperfect in cartilage than in more vascular tissues, whereas the other structures which constitute the walls of the abscess are becoming fortified by newly formed fibrous tissue to withstand the period of increased tension, the cartilaginous plates of the bronchial tubes are left relatively weak. The longer the duration of the closed stage of the abscess the more probable it is, therefore, that rupture will ultimately take place into the bronchi. This termination is favored by cough. For the lung being equably compressed during the expulsive effort with closed glottis, which constitutes the first stage of cough, when the glottis opens the pressure suddenly becomes negative in the bronchi, and the contents of the abscess are consequently strongly aspirated toward them. The changes of pressure from this cause are, of course, greater the larger the bronchus. It is probable, therefore, that the abscess will be evacuated at the most favorable point—*i. e.*, into the tube which will most directly discharge the pus. If the foregoing views are correct, aspiration, which, as a rule, in empyema, simply delays the more efficient operation by incision, is of much greater value in the treatment of the subpleural abscess. It is, perhaps, unnecessary to say that every care should invariably be taken to make the needle perfectly aseptic. Pleurotomy is not to be recommended in the treatment of the closed abscess, not only because the more favorable termination is probably by rupture into the bronchi, but also because the presence of adhesions is uncertain. Nothing is more difficult to determine than the presence or absence of adhesions in a given case. The greatest individual differences are observed, and the assumption which appears to be almost universally made, that adequate adhesions are necessarily present in superficial pulmonary suppurations, has led to the production of empyema and even to fatal results after the operation of pleurotomy. Thus Quincke[1] lost a case of pulmonary abscess, upon which he had operated, from empyema due to defective pleural

[1] Berlin. kl. Wochenschrift, 1887, No. 19.

adhesions.[1] When the abscess fails to cicatrize after rupture the indications for treatment become, of course, identical with those of the chronic discharging abscess.

The chief results of our inquiry may be summarized as follows:

1. Closed pulmonary abscesses are abscesses of the connective tissue, of which the most favorable and most common form is the subpleural abscess.

2. The subpleural abscess may attain a large size without causing a corresponding destruction of pulmonary tissue; for the individual pulmonary lobules, isolated by the suppurative process, retract before the pus in a manner analogous to the retraction of the lung as a whole in the presence of pleural effusion.

3. The frequency of the occurrence of subpleural abscess is probably greater than is commonly supposed; for this abscess simulates empyema so closely that it is generally mistaken for that disease.

4. The only trustworthy means of distinction between these two diseases is probably the microscopic examination of pus withdrawn by aspiration previous to rupture.

HYDATIDS OF THE LIVER.

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The literature on this subject is very extensive from the eighteenth century on, and it is a noteworthy fact that more than 50 per cent. of all cases recorded occurred in the liver. Dr. Alexander Hugh Ferguson, of Winnipeg, has probably seen more cases of this kind than any other surgeon in America. Prof. William Osler, of Baltimore, in his late valuable work of 1894, claims to have gathered the literature of only 85 cases in the United States.

Etiology and Pathology. The parasite that causes this trouble is known as the tænia echinococcus. The mature tænia is a small tapeworm, one-quarter of an inch long, and inhabits the intestinal canal of dogs, jackals, and wolves. It has four segments, the last of which is as long as the other three combined. The head has a pointed beak, with a fringe of thirty to forty hooklets at its base, and four suckers. It has a vascular system running down each side of the body.

The ova of this worm are introduced into the alimentary canal with the food, but more commonly with the drinking-water. The embryo

[1] See also Godlee, Lancet, vol. i., 1887, p. 457, and Coupland, British Medical Journal, vol. ii., 1885, p. 427.

emerges from its shell and makes its way into the surrounding tissues, and may often be carried along in the blood-current as an embolus until it finds a resting-place in the lung, liver, kidney, thyroid gland, breast, heart, vermiform appendix, subperitoneal tissue, connective tissue of the trunk and limbs, the omentum, the medulla of the bones, spinal cord, or the brain. In the brain the cerebrum seems to be the most frequent seat of the cyst, the right lobe being affected oftener than the left. After reaching its destination it gradually develops into a hydatid cyst.

The scolices or heads are formed in brood-capsules. These scolices are directly continuous with each other by means of the parenchyma of the main and daughter-cysts. The walls of the hydatids consist of two layers, an outer cuticular or ectocyst or chitinous layer, and an inner or parenchymatous or endocyst layer. The cuticular layer is very elastic, and curls inward when divided. The parenchyma consists of granular matter, cells, and muscle-fibre.

The scolices are seen projecting from this parenchyma as small, wart-like bodies, and are frequently in groups of four or more attached to a common stem. They measure about 3 mm. in length and have four suckers and a fringe of hooklets, the same as the adults. These hooklets often become detached, and during a tapping of the cyst are withdrawn, and this forms the pathognomonic sign of hydatids. The fluid is non-albuminous, of low specific gravity, 1000 to 1010, and, as a rule, is clear, though at times it may be bile-stained.

The brood-capsules are developed from the parenchyma, and also have two layers, the outer one being the parenchymatous layer of the mother-cyst, and the inner one being the cuticular layer. It will be seen from this that the order of layers is reversed in the brood-capsules from that of the mother-cyst.

The daughter cysts may develop cysts of their own, and these are termed granddaughter-cysts or endogenous daughter cysts. Where this process takes place the mother-cyst, as a rule, is very large and may contain thousands of daughter-cysts. Some echinococci-cysts do not develop brood-capsules, and still attain great dimensions; these are termed sterile cysts.

The presence of the cyst irritates the surrounding structure and gives rise to the formation of a thick fibrous sheath or capsule, which at times is very vascular.

An interesting question in considering the pathology of this disease is, What becomes of the liver-tissue where large cysts develop in this organ? Some authors believe that an atrophy takes place, others are of the opinion that a hypertrophy take place; but it is my firm belief that the liver-tissue is never destroyed to any physiological extent unless there be an inflammatory exudate as a result of long-continued pressure in the liver, for if there was, how could it be possible to record such rapid

improvement in these cases as is the general rule. I believe that by the slow growth of the cyst within the liver this organ gradually becomes compressed as a lung would be by pleural effusion.

If the cyst grows to a sufficient size, there will be interference with the physiological functions of the liver; but on tapping or opening these cysts the liver immediately expands and resumes its normal functions, as a lung does on being relieved of the presence of a pleural effusion. The thick connective-tissue capsule must also have some formation, and I believe it is formed from liver-tissue, due to the inflammatory exudate, as a result of pressure, forming a fibrous capsule, this capsule being the liver's protection.

The symptoms of hydatids of the liver vary, depending upon the size and location of the same. When sufficiently large and near to the surface they may be felt as globular tumors, of a firm and resisting tendency, and yet slightly elastic; in some cases fluctuation can be determined, according to the amount of fluid present.

The tumor may be situated behind the liver, and in cases of this kind, where it does not grow to a large size, may give rise to no external manifestations. In other cases, in which the tumor is situated posteriorly, as it grows it pushes the liver before it: hence there are a flattening and downward protrusion of this gland, with a corresponding increase of hepatic dulness.

As the cyst grows we have our attention called to pressure-symptoms. The patient may feel the tumor, or complain of a dragging sensation, or, as some explain it, as though there was a weight attached to the liver. There may be dyspnœa and a dry cough as a result of the upward growth of the cyst toward the diaphragm; we may also find an explanation for palpitation by the displacement of the heart by the tumor. The stomach may also be interfered with, and we have as a result vomiting, different gastric symptoms, and emaciation.

When the portal vein or vena cava is pressed upon we look for ascites, jaundice, and hemorrhoids. Absence of bile in the feces may be due to direct pressure of the hydatid upon the bile-ducts. An acute pleurisy may be due to rupture of a hydatid into the pleural cavity. Peritonitis results from the emptying of the cyst into the peritoneal cavity.

Diagnosis. This is really difficult, if not impossible, in the early onset of the disease, as some patients retain good health for years, and even die at an advanced age from some other trouble, without being aware of the fact that they are subjects of this disorder. *This also shows that there can be little if any physiological destruction of the liver.*

Differential Diagnosis. It is sometimes possible to differentiate hydatids from cancer of the liver, abscess, enlarged gall-bladder, aneurism, pleurisy, and cysts of the right kidney.

In cancer of the liver we have an irregular surface and border, pain, rapid progress of the disease, and the well-marked cachectic appearance of the patient. In abscess of the liver there will be local pain, with a history of rigors, hectic fever, and very likely antecedent attacks of dysentery. It is well to mention here that hydatids sometimes suppurate, but the constitutional symptoms are not so severe as in abscess.

A hydatid cyst may frequently be mistaken for an enlarged gall-bladder, but the pyriform shape of this organ, with the history of biliary colic and jaundice, should be remembered in making a differential diagnosis.

An abdominal aneurism will pulsate and give the bruit along the course of the aorta. To differentiate hydatids from pleural effusion of the right lower chest, we observe the following points: In pleurisy the fluid will change with the change of position of the patient, and the liver is not necessarily enlarged, while in hydatids the fluid is stationary and the liver almost always enlarged.

In cysts of the right kidney we will obtain a history of the tumor starting below and growing upward, while the reverse holds good in hydatids of the liver. In the former we have tympanitic percussion due to the colon, while in the latter there is always dulness.

Results of Hydatids. Hydatids of the liver may cause no trouble whatever or they may result in the following:

1. By pressure interfering with the functions of some organs of the body, and by attaining a large size, causing ascites and dropsy.

2. Forming adhesions with the diaphragm and ulcerating through, either into the pleura, causing pleuritis, or further ulceration may take place in the lung, and the contents, coming originally from the liver, may by this channel be expectorated and lead to a spontaneous cure.

3. A fistulous opening may be formed into the lumen of the bowel and lead to a cure.

4. If they open into the stomach and the fluids and cysts be vomited, a cure is the result.

5. If a simple cyst ruptures into the kidney or bladder, a spontaneous cure is possible.

6. If they empty into the pericardium, the peritoneal cavity, bile-ducts, or gall-bladder, the result is disastrous.

7. Cases are on record in which hydatids have invaded the trachea and produced death by suffocation.

8. Nature's best cure, without any surgical aid, is the formation of adhesions to the parietes. Cases are on record which have emptied themselves externally, but this favorable result is not often met with.

9. Finally, a calcareous degeneration may take place within the cyst, and thus lead to a very satisfactory termination.

CASE I.—Family history negative. Patient's history: female, aged thirty-two years; Russian; height, 5 feet7 inches; weight, 120 pounds. Was always in good health up to her twenty-fourth year, that is, eight years ago, when she noticed a hardness and fulness in the right hepatic region. Her bowels at this time were regular, appetite good, and she had no pain or fever. She continued in good health up to a year before the operation, when she complained of pain and had fever and loss of appetite. In the intervening seven years she noticed that the mass in the right side grew very slowly. She never was jaundiced and never was closely associated with dogs.

I saw the patient for the first time on October 3, 1893, at the St. Elizabeth Hospital, and after a careful examination advised operation, my diagnosis being cyst of the gall-bladder due to an inflammatory obstruction of the common duct.

On October 10th, with the assistance of Drs. Luken, Kunz, and Wittwer, a vertical incision was made over the most prominent portion of the mass to the cyst. There being no adhesion to the parietal peritoneum, the finger was introduced, and the tumor found to be adherent to the omentum, the intestines, and to the under surface of the liver. An aspirator was introduced into the cyst and the characteristic fluid withdrawn. I immediately knew that I was not dealing with a cyst of the gall-bladder. The fluid commenced to ooze out after the withdrawal of the needle. A sponge was placed over the puncture and several other sponges were packed around the mass, so as to close off the abdominal cavity. The patient was then turned on her right side and with a knife the sac was freely opened, and as the cyst-wall became more lax forceps were attached to the margins of the cyst and the sac pulled out and emptied. It was then irrigated, the sponges removed and thrown away. The peritoneum was then sewed around the cyst-wall by a continuous suture, and two inches of the sac were removed. A large-size rubber tube was introduced, besides gauze-packing. The wound was dressed and the patient put to bed. The wound was dressed daily. A week after the operation large quantities of bile began to discharge, and continued to do so for two weeks. It was about three months before the entire cyst-wall contracted down and the fistulous opening became closed. The cyst in this case was about the size of a small fœtal head. It grew from the under surface of the liver, and instead of protruding outward grew downward, and thus formed adhesions to the intestine and omentum. She had no rise of temperature at any time after the operation.

I saw the patient on November 10, 1894, at which time she was in good health, but complained of pain at the site of the operation, which is due to a ventral hernia, the patient having failed to follow instructions and wear a supporter, as she was told to do.

CASE II.—Family history negative. Patient's history: male, aged twenty-eight years; German; married; height, 5 feet 5 inches; weight, 120 pounds. Always had dogs about him. Nothing worthy of mention occurred for twenty years; at this time he was taken ill suddenly, with a severe pain in the right side in the region of the gall-bladder. He was ill for four and a half weeks, but did not know what ailed him or what he was being treated for. For the following five years he had occasional attacks of pain in the right side, but aside from this was perfectly well, his appetite remaining good, bowels regular, and he slept

well. Three years ago he was sick for four weeks with an attack of typhoid fever. Recovering from this, he was in good health up to September 1, 1894, when he was again taken with a pain in the right hepatic region. He had a chill, followed by a temperature of 103.5° F.; he rapidly became jaundiced, and his physician informed him that he had gall-stones. During the following two weeks he suffered much pain and vomited bile-colored material.

On September 25th I was called to see the case through the kindness of my friend, Dr. Landis, and found the following conditions: A not well-marked hardness was felt at the supposed lower border of the liver, in the region of the gall-bladder; percussion gave dulness to a limited painful area the size of a fifty-cent piece. The patient was jaundiced to saturation, had an anxious, pinched look, and was very much emaciated. He had a temperature of 103° F., and a small thready pulse of 120. Although the hardness seemed a trifle high to be situated in the gall-bladder, I also was led to believe that I was dealing with a case of biliary calculus.

The operation was performed the same afternoon. With my assistant, Dr. Kunz, and in the presence of Drs. Landis and Chapman, an oblique incision was made over the region of dulness, two inches below the costal cartilages, through the peritoneum. A tense, white surface was brought into view, and my first thought was of abscess of the liver. The gall-bladder was examined, and being found empty I next proceeded to a more minute examination of the whitened surface. Sweeping my finger around this plane I discovered that adhesions had slightly formed in two places. I next sewed the peritoneum around the liver-border of the shining mass, and thus completed what Nature would have finished in a short time had the patient lived long enough without surgical interference. I now had to deal with a circular surface about the size of a silver dollar closed off from the abdominal cavity. Sponges were packed around the edges and the aspirating-needle introduced. A clear fluid was withdrawn, and my diagnosis was changed to that of hydatid of the liver. The needle was withdrawn and gauze packed over the puncture, which in this case gave rise to no leakage. The wound was dressed in the ordinary manner and the patient put to bed. His temperature dropped to normal, and four days later, the adhesions having become firm, a large opening was made through the centre of the white mass and hundreds of cysts immediately popped out. The cyst-cavity was thoroughly irrigated with sterilized water and the inner surface gently curetted with a dull curette, the object being to loosen the daughter-cysts from their parenchymatous attachment. A large-sized rubber drainage-tube was introduced and the wound again dressed. Several days later bile was discharged in large quantities and continued to discharge for a week. The jaundice disappeared and the fistulous opening soon contracted.

The patient, November 19, 1894, feels perfectly well and is attending to his duties, which are those of a teamster. He has gained twenty-six pounds since the operation.

In regard to the treatment of hydatids of the liver little more need be said than that which I have already brought out in the treatment of my two cases. For general rules, I think the following will be found applicable in the majority of cases:

1. An incision over the most prominent portion of the presenting mass, be this high or low; or, if no tumor can be discovered, the area of hardening and increasing dulness should be our guide for incision.

2. Examine for adhesions: if they be complete, our work is simplified; if not, we must sew the peritoneum all around the mass so as to shut off the abdominal cavity.

3. Introduction of the aspirator. This needs no explanation; but it is well to bear in mind that we do not always obtain the characteristic fluid, as at times the fluid may be too consistent to enter the needle.

4. We must wait for three, four, or five days for adhesions to become firm, before opening the cyst.

5. When the cyst is opened a large opening should be made and the largest size rubber-drain introduced.

6. The dressings must be made under strict antiseptic precautions, as there is a possible danger of secondary infection.

7. The cyst-cavity should be washed out with sterilized water for the first week, after this with carbolic solution, iodine solution, peroxide of hydrogen, boric acid, creosote, or any of the antiseptic solutions.

The point on which there has been more diversity of opinion than any other is: Where there are no adhesions should the operation be made in one or two sittings? Most authors advise two operations, claiming that there is too much danger of allowing the hydatid fluid to enter into the peritoneal cavity, which would perhaps result fatally, or it might form a nucleus for another cyst.

With care an operation of this kind can be performed in one sitting, as my first case will show; but the best plan is, if time will permit, first to sew the peritoneum to the sac and wait four or five days for the adhesions to become firm, as was done in my second case.

PROGRESSIVE MUSCULAR DYSTROPHY,

WITH SPECIAL REFERENCE TO IMPROVEMENT BY TREATMENT.

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Before proceeding to the report of my own case, a short review of recent contributions to the many mooted questions regarding progressive muscular dystrophies will not prove uninteresting to the reader.

As a result of this subject, which was carried on for many years by Duchenne, Aran, Charcot-Leyden, Friedreich, and Lichtheim, there were finally created two divisions of progressive muscular atrophy—a spinal form and a primary myopathic form, including the pseudo-hypertrophic

cases. The acceptance of this view was especially due to the exhaustive and comprehensive articles which were published by Erb in 1883. Erb separated the juvenile form from the typical progressive muscular atrophy of the spinal form, and recognized the relationship of the former to Leyden's hereditary and the pseudo-hypertrophic forms. In 1891 he grouped these types under the heading of "Dystrophia Muscularis Progressiva." In 1884 he described this dystrophy as a muscle-disease, which may show itself either with hypertrophy followed by atrophy, or primarily with atrophy, with hyperplasia of the interstitial connective tissue, and which in the end regularly terminates in a greater or less lipomatosis. Whether the changes in the muscles or connective tissue, or in both at the same time, are the primary causes could not be determined.

The peripheral nerves and the cord did not show any visible changes. It is a chronic, slowly progressive disease, in which atrophy, hypertrophy, or pseudo-hypertrophy may be present at different periods. Whatever type the dystrophy may assume, the disease is characterized by an affection of the same muscles, by absence of fibrillary twitchings, and absence of the reaction of degeneration. It may begin and be especially marked in the upper or lower portions of the body, according to the age of the individual. Erb gives the following reasons for classifying all these forms under one head:

1. The constant occurrence of the same characteristic features in a large mass of clinical material.
2. The appearance of transitional forms.
3. The occurrence of different forms in the same family.

The juvenile form he describes as occurring in youth and middle age. There is an early affection of the muscles around the shoulders and upper arm and a limitation of the hypertrophy and pseudo-hypertrophy to individual muscles.

Pseudo-hypertrophy occurs in earliest childhood, especially in males; attacks the pelvis, lumbar-, thigh-, and calve-muscles. The hypertrophy is extended over a large area. Atrophy is present, especially in the upper extremities. The infantile form is characterized by the primary affection of the face.

The same pathological findings are present in all. Hypertrophy and atrophy of the muscular fibres, infiltration of round-cells, vacuoles in the muscles, splitting and division in the muscle-fibres, hyperplasia and round-cell infiltration in the connective tissue, increase in deposit of fat-cells to the highest degree of lipomatosis. The nerve-fibres and the cells in the anterior gray horns in the majority of cases are unchanged. Positive findings, as in the case of Heubner, are seldom.

Erb does not wish to say positively that the dystrophies are of primary myopathic origin. The constant occurrence of nervous disturbances

and the constant localization of the process to the same class of muscles speak very strongly for the central origin of the disease.

This monograph was the incentive to the appearance of a large amount of literature upon this subject, which was justly classified as Erb had advised, and much also in opposition to his classification and views.

In 1886 Charcot and Marie described a third new form of progressive muscular atrophy which differed from the muscular atrophies, and was also distinct from the spinal atrophies. By Tooth, Sachs, and Herringham this type was described as the peroneal or leg type of progressive muscular atrophy. Hoffman gave it the name of progressive neurotic musuclar atrophy. According to Charcot and Marie, this form begins in the leg and foot; the small muscles of the foot are first affected, then the peronei, calves, thigh-muscles, and the muscles of the upper extremities, the muscles of the upper arm, head, and back remaining free. There are present fibrillary twitchings and the reaction of degeneration. The disease usually begins in childhood. Sachs and Herringham called especial attention to the hereditary taint which existed in these cases. Hoffman cited two cases, one an autopsy by Virchow and the other by Friedreich; both showed a degenerative atrophy in the muscles and peripheral nerves due to changes in the cells of the anterior gray horns.

Since this publication of Erb's the study has steadily gone on, and Hoffman has published cases of neurotic muscular atrophy in which he found histologically hypertrophied fibres. Hoppe described two cases of the facio-scapulo-humeral type with reaction of degeneration, and tried to establish its connection with the spinal form of progressive muscular atrophy. Strümpell relates a case which is analogous to that of Heubner and Frohmaier. Hereditary influences were present. Atrophy began in the small muscles of the hand; there were no fibrillary twitchings and no reaction of degeneration. Histological examination showed the peripheral nerves and the cells as atrophied, also the muscles were found atrophied, and some partly hypertrophied; some increased in volume, some splitting, and some vacuoles. He came to the conclusion that the atrophy began in the muscles and ascended in the nerves, eventually involving the cells in the anterior gray horns. Lewin, in his pathological and anatomical studies upon this subject, believes that progressive muscular atrophy is due to a diffuse process at work upon all the muscles, and that the cell-infiltration is one of the earliest expressions of the disease; that some irritating influence upon the muscle causes an increase of the muscle-nuclei and the connective-tissue round-cells. This in turn causes the disappearance of the muscle, by actually destroying it and using up the nourishment intended for this part of the human anatomy, and thus indirectly causing its disappearance.

Such is the literature upon this subject up to the present time. First

considered as an individual disease due to a lesion in the anterior gray horns, then a division is made into spinal, myopathic, and neurotic forms. The tendency now is to bring the myopathic, the neurotic, and the spinal forms, after more advanced clinical and anatomical studies and general pathological considerations, under one head; the cause to be due to the disturbance of the trophic neuron of the motor apparatus. In a case lately contributed by Marinesco, of the Hoffman neurotic type, in which there were well-marked sensory disturbances, the autopsy showed degenerative changes in the peripheral nerves, with marked increase in the connective tissue and degeneration of the posterior roots; in the cord, sclerosis of the posterior columns; also sclerosis of Lissauer's tract; atrophy of the ganglionic cells and fibres in the anterior and posterior gray horns. Marinesco believes this so-called neurotic type to be a disease of the direct motor and sensory neurons, and considers that there is an hereditary predisposition to this particular affection.

The patient considered in this paper is clearly an example of a progressive muscular dystrophy:

This patient, F. Y., was presented before the New York Neurological Society two years ago. The history given at that time presented the following conditions: He was twenty years of age, and had been perfectly healthy up to May, 1892. He had not experienced the slightest difficulty in performing any muscular movement previous to that time, nor did he show any real or apparent decrease or increase in his weight. The first indication he had that there was anything the matter with him was in the latter part of May, 1892. He began to suffer from vague pains in the region of the spleen and liver. These pains would only trouble him whenever he would walk any great distance or exert himself to any great degree, otherwise when at home and at rest the pains were not marked enough even to attract his attention. Shortly after this he noticed that he began to have difficulty in climbing upstairs; that his gait became peculiar, and, as he expressed it, "resembled that of a camel." This condition gradually grew worse. He noticed that he was beginning to lose flesh, and that his lower extremities were beginning to be very thin. At first all this weakness was confined to the lower extremities, to the lower part of the back and muscles around the thigh, then it appeared to involve the muscles of the shoulders, and finally it attacked the muscles of the neck and the face. The latter the patient did not notice at all until his attention was attracted by myself to this condition.

The patient denied any alcoholic or syphilitic history; never had he had any rheumatism or any other severe illness previously to this trouble. He was formerly connected with an athletic club, and indulged quite freely in their sports; but mentioned, in connection with gymnastic exercises, that he noticed that while he was excellent at running *he very soon grew tired whenever he attempted any violent exercise with his upper extremities.* This last statement has led me to believe that although he may have noticed the weakness in the lower extremities previously to that of the upper, that the disease first showed itself in the upper extremities.

His mother is living and healthy; his father died of smallpox and

was a heavy drinker. The patient has one brother and sister living, both older than himself and perfectly healthy. They are both married, and have children who are normal in every respect. A brother of his father died in an asylum for the insane; his father's father was of a gouty disposition. His mother's mother was rheumatic and asthmatic, otherwise the family history, which I have carefully investigated, having examined several members of the family, was negative.

Patient's condition in 1893: Patient was a bright and intelligent-looking fellow. The expression of the face was not at all unnatural, though it looked emaciated, and the voice and speech appeared normal. There was no distinct abnormality about the formation of the skull; the ear on the left side, however, appeared a little flattened and misshapen. The eyes were normal in every respect. Swallowing and chewing were accomplished without any difficulty. The tongue acted normally in all its movements. His general appearance was that of a person very much emaciated. He could stand without support; but, as soon as he attempted to walk, one noticed the great difficulty he had in lifting his legs, and a waddling gait. The emaciation was especially distinct in the neighborhood of the shoulders, back, and thigh regions. When he made an attempt to stand upright he assumed the position of one with a marked lordosis in the lower dorsal and upper lumbar region, and with a slight scoliosis in the lower dorsal. A plumb-line let fall from the prominence of the seventh cervical vertebra shows this line to be four and one-quarter inches distant at the deepest part of the lordosis, and one-half inch toward the right of the median line. On lying down it was impossible for him to turn over on his side or lift his head from the pillow. On asking him to stand up from the sitting position, he did so in a manner similar to the way which Gowers described to be so characteristic of cases of pseudo-hypertrophic paralysis. The patient presented the winged scapulæ and loose shoulders when one attempted to lift him from the floor. The paralyses were all of the lax order, and the muscles were soft and flabby. Covering them was a large amount of redundant skin. There were no contractures, no fibrillary twitchings. I could not find any vasomotor or trophic disturbances of any kind present. The sensation in regard to pain, temperature, tactile and muscular sensation was perfectly normal. The heart, kidneys, lungs, spleen, and liver were in perfect condition. There was no visible pseudo-hypertrophy, nor could I obtain from the patient any history of any such condition ever having been present. The deep reflexes were very much diminished on both sides. The nerves were not painful or tender on pressure, nor did they seem to be anywhere thickened. The spinal column was in no way tender to percussion, but presented the deformities above mentioned.

When we examined the muscles we found the following conditions present: A marked paresis and atrophy without hypertrophy of the following muscles: sterno-cleido-mastoid, trapezius, superior and inferior spinati, rhomboidei, latissimus dorsi, and serratus magnus muscles. The pectorals, deltoid, and triceps were also involved; the biceps, spinator longus, and brachialis anticus very much affected. The muscles of the forearm and hand appeared normal. Through this atrophy and paresis all the movements governed by these muscles were limited. The patient could hardly raise the arm to the horizontal position. At rest the shoulder appeared sunken and the scapulæ projected wing-like

from the thorax. Mechanical excitability was very much diminished. The paresis and atrophy were symmetrical. The electrical examination gave quantitative changes, but no reaction of degeneration. The muscles around the thighs, the glutei, quadriceps, and the long muscles of the back were in the same condition of atrophy and paresis as the muscles above, thus disturbing the walk of the patient to a very great degree. The abdominal muscles were only very slightly affected. In the face, the muscles supplied by the seventh nerves suffered, especially the orbicularis oris and the orbicularis palpebrarum. There was also noticed a slight atrophy of the tongue on the right side. Just previously to his presentation before the Society, a piece of muscle was removed from the deltoid which I carefully examined. It presented but few histological changes, but still characteristic enough to substantiate the diagnosis. There was present a simple atrophy of the muscle-fibres with an increased cell-infiltration both in the muscle and in the connective tissue. This cellular infiltration was especially marked in the interstitial tissue between the muscular fibres. It was also present to a certain extent in the muscle. The muscles had still retained their structure. No hypertrophied fibres could be found. There was no evidence of fatty deposit anywhere in this particular piece of muscle. The small bloodvessels present in this specimen were filled with blood, and the walls were also infiltrated with round-cells.

Such was the condition of this patient when he was presented two years ago. There was no hereditary taint, excepting the alcoholic habit of the father and that an uncle had died in an asylum for the insane, which might predispose to degeneracy. In advanced youth he developed a progressive muscular atrophy in the particular group of muscles mentioned above. The localization of this atrophy, together with the area of distribution, the absence of electrical changes, of fibrillary twitchings, and of pseudo-hypertrophy, and the lack of all sensory disturbances, left no doubt that this was a case of the myopathic type. The form which it most closely resembled was that of the facio-scapulo-humeral type of Landouzy-Déjèrine. With regard to the fibrillary twitchings and electrical examinations, I would like to state that the former were frequently looked for, and the latter often made; but at no time could a trace of the former or a change in the latter be detected. A peripheral neuritis or lesion in the anterior gray horns could not in this case be thought of; for, if the former were present, we should not expect to find a simple atrophy of the muscles, but a degenerate condition would be present in this structure. We should also expect to find the reaction of degeneration. The absence of these characteristic symptoms, the constant absence of pain, the widespread character of the affection without reference to the distribution of the peripheral nerves, its continuance and progression during several years, preclude the diagnosis of a generalized neuritis.

The patient at that time was under my care, and, although the usual tonics and electrical treatment were thoroughly persevered in, no improvement was noticed. It finally occurred to me that electricity was,

after all, but a feeble agent in stimulating the growth of the muscular fibres, as compared with the physiological stimulus of voluntary effort. I determined that it would prove worthy of trial to have this patient undergo a systematic course of physical training. This was to be indulged in daily, and never to be carried to the point of exhaustion. This, I believed, would at least induce further growth, and give greater power to those muscles or muscular fibres which had not suffered much damage. The very idea that the disease began late in youth, a period of perfect development intervening, according to the history of the patient, suggested that probably other influences co-operated with the congenital tendency, if there was any in this case, in developing this disease in this individual. Therefore, probably, if this influence could be overcome or checked, improvement must follow. What this influence was, the reader will not expect me to define; but that it may be arrested and improvement result to such a degree that almost all of the disagreeable symptoms in this patient disappeared, the patient now fully demonstrates. The method which he has pursued in order to undergo this systematic exercise has been the daily use from half an hour to an hour of practice with dumb-bells, Indian clubs, and a health-exercising machine.

There is no movement which he cannot now perform with the greatest ease. He walks more erect, and his lordosis, which showed four and one-fourth inches at its greatest depth when a plumb-line was let fall from the cervical vertebra, now shows only three inches; the scoliosis only one-quarter of an inch from the median line. The scapulæ by no means project as they did formerly, and the patient now puts on his coat, collar, and shirt without any assistance. He can raise his head from the pillow, he can turn about in bed, and walk great distances without the least exertion; his latest achievement is a ride of forty miles in one day on a bicycle. The waddling gait is no longer noticeable. No improvement has been noticed in the face, and, strange to say, this is the only part of the body that has not been subjected to forced exercise. The patient has gained in weight. Some of the muscles still show atrophy; the patellar reflex on the right side is retained; the improvement is especially in the muscular movements and particularly in the partial return of the normal contour of the atrophied parts.

Without wishing to claim too much for this method of treatment, as I have only this one case to report, it seems to me that when the chance is offered one should surely give this method a very careful and thorough trial. I do not think it will be efficacious in those cases in which the disease begins early in infancy, and in which the muscles have been but poorly developed; but where the disease begins in advanced youth, and the muscles have been previously perfectly developed and then begin to undergo atrophy, in such cases I think we may expect the improvement

which has been obtained in this patient. And in addition to the success of the therapeutic efforts in this case, the possibility of improvement having been here demonstrated will, I hope, take some of the cases of progressive dystrophies out of the category of incurable maladies.

I wish to express my thanks here to Dr. B. Sachs, of this city, for the material which he has placed at my disposal and his kind assistance in many other ways.

Bibliography.

Hoffman: Spinal Muscular Atrophy. Archiv für Psychiatrie, Berlin, 1892, 24.

—— Ueber Progressive Neurotische Muskelatrophie. Archiv f. Psych. u. Nervenkrankh., 1889, xx. 3.

—— Deutsche Zeitschrift für Nervenheilkunde, Leipzig, 1892-3, pp. 427-70.

Hofe: Centralblatt für Nervenheilk. und Psychiatrie, Leipzig, 1892.

Strümpell: Loc. cit., pp. 471-501.

Charcot-Marie: Revue de Médecine, 1886.

Erb: Dystrophia Muscularis Progressiva. Neurologische Centralblatt, 1889.

Volkmann: Vorträge, 1890, 1 and 2; Deutsche Zeitschr. f. Nervenheilkunde, Bd. iii.

Heubner: Wagner Festsschrift, Leipzig, 1887.

Westphal: Charité Annalen, 1886, xi. p. 357.

Sachs: Progressive Muscular Dystrophia. Journ. of Nerv. and Ment. Disease, 1888, xiii. 11.

Landouzy-Déjérine: Nouvelles recherches cliniques et anatomo-pathologiques sur la myopathie atrophique progressive à propos de six observationes nouvelles deut une avec autopie. Revue de Méd., 1886, vi. 12, 977-1027.

—— De la Myopathie, Atrophique progressive. Revue de Méd., Feb., March, 1885.

Lichtheim: Ueber hereditare progressive Muskelatrophie. Schweizer. Centralb., 1888, xviii. 19, p. 603.

—— Ueber hereditare progressive Muskelatrophie. Centralb. f. Nervenheilk., 1888, xi. 20.

Marinesco, M. S.: Contribution à l'étude de l'amytrophique Charcot-Marie. Archiv de médecine expérim. et d'anatomie pathol., Nov. 1894, No. 6, i.

Herringham: Muscular Atrophy of the Femoral Type affecting many Members of a Family. Brain, 1889, xi. p. 230.

Sachs: Brain, Jan. 1890. Peroneal form or leg type.

Schultz: Monograph, 1886.

Jorth: Brain, vol. x. Peroneal type.

Erb: Ueber das Vorkommen der Chron. Atroph. Spinallahmung beim Kinde. Neurol. Centralbl., 1883, ii. 8.

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TRAUMATIC ANEURISM OF THE FEMORAL ARTERY THIRTY-EIGHT DAYS AFTER GUNSHOT-WOUND OF FEMUR; LIGATION IN HUNTER'S CANAL; RENAL COLIC AS A COMPLICATION.

By George Tully Vaughan, M.D.,

passed assistant surgeon m. h. s.; in command u. s. marine hospital service at philadelphia.

J. H., captain of a schooner, aged thirty years, native of New Jersey, was admitted to hospital, May 27, 1895, with fracture of the right femur caused by a conical ball fired from a Winchester rifle on the same morning. Patient was running at the time, and fell immediately on being struck. On attempting to rise he found that he was unable to do so, and a few minutes later fainted. The wound bled freely, but was

dressed by a physician, who did not probe it, and the patient was then transported by rail some ninety miles to the city. On examination under ether, twenty-four hours after the injury, a complete fracture of the femur in the lower third was detected. A single wound on the posterior surface of the thigh, about 20 cm. above the knee, marked the entrance of the ball—apparently a 48 in size.

There was no wound of exit. A probe was passed, without force, downward and forward between the fragments of bone to the front of the thigh, where the point could be felt about 8 cm. above the upper border of the patella. The synovial cavity of the knee was distended with fluid, the nature of which was not determined, floating the patella; but all attempts failed to locate the ball. The wound was dressed with aseptic gauze, and a Buck's extension-apparatus with five pounds and sandbags was applied. The temperature rose a little, being 38.5° C. May 29th, 40° on the 30th, after which it descended, so that on June 5th it was normal.

June 19. The swelling in the thigh and knee having subsided, a plaster-dressing was applied from hip to toes with a window over the wound for dressing. There had been no suppuration, only a slight discharge of bloody serum, which had almost ceased.

July 4. The condition of the patient had been satisfactory, though there were occasional pains in the limb, but they were not regarded as serious. To-day, however, at noon, he felt severe pain at the site of the fracture, which continued all night, preventing sleep, and he was suffering extremely when I saw him at 10 A.M., July 5th. Temperature 38°; pulse 85. The plaster was removed at once, revealing a large swelling with deep fluctuation on the inner side of the thigh above the location of the fracture. Considering the length of time since the injury, the condition was not believed to be caused by hemorrhage, but rather to an accumulation of pus by infection from the ball, although there had been no suppuration from the wound. The patient was etherized and the tumor carefully opened, first by an incision through the skin and fascia, and then by boring a grooved director through the muscle, when blood and clots began to escape. A rubber tourniquet was applied and the incision extended until the tumor was well laid open, evacuating about 1000 c.cm. of blood-clot. At the bottom of the cavity thus formed the femoral artery was seen with a rupture in it between 1 and 2 cm. in length, just above the opening in the adductor magnus muscle.

The artery was ligated with silk above and below this opening, the cavity packed with iodoformized gauze, and a dressing applied. No loose fragments could be felt about the fracture, though a sharp-pointed one was apparent to the touch, near, but not pressing on the artery. The fragments were pretty well surrounded with callus, but there was still some motion. At the close of the operation the patient was extremely weak and death threatening. Five hundred cubic centimetres of normal salt-solution were injected subcutaneously in the breast. Hypodermatics of strychnine were given and warm applications made to the extremities. The leg on the affected side was cold, but four hours after the operation the circulation was almost as good as that of its fellow. There was little fever after the operation, the temperature reaching only 38.4° C. for three or four days.

July 14. The gauze was removed for the first time from the cavity. There was no pus or blood, and the wound was closed with adhesive

plaster and the sandbags reapplied, but without the extension. There was steady progress to recovery after this, the wound healed and there was firm union of the bones, when, on August 29th he had an attack of renal colic, with severe pain in the right lumbar region, frequent micturition, burning in the urethra, and vertigo. Temperature 37.5° C.

September 1. Temperature reached 39°. Nausea, but no vomiting. Constipation. Urine contained pus, excessive amount of urates; specific gravity 1026.

3*d*. Patient was chilly yesterday, and his temperature was 40°. Temperature the same to-day, and he has been vomiting. The pain is located exactly at "McBurney's point," and there is tenderness there on pressure, caused, no doubt, by the gravel lodging at that point in the ureter. Appendicitis was suggested, but was excluded by the history of attack and the continued presence of pus in the urine.

6*th*. Patient passed a gravel about the size of a pea, rough and jagged, after which there was no more pain or fever.

On the 8th he was allowed to get up, and was discharged, recovered, October 12th, with 4 cm. of shortening of the right femur, but with good use of the limb.

January 13, 1896. Patient came to my office and was in excellent condition. Said he had slight rheumatic pains in damp weather and numbness along the inner side of the leg and foot, this latter symptom no doubt, being due to injury of the long saphenous nerve at the time of the operation, although the nerve was not observed at that time.

The points of interest in this case are (1) the probable manner in which the artery was injured, whether by the bullet or by a fragment of bone, and, if by the latter, whether the injury was done at the time the wound was received, or later by manipulating the thigh.

As the probe following the track of the bullet passed through the bone without any lateral deviation, it does not seem possible that the bullet could have touched the artery, unless, having split on the bone, a section was deviated in that direction. Possibly the attempt to rise or the unavoidable motion produced in transferring the patient such a distance to the hospital may have caused bruising of the arterial coats by a fragment of bone. It is not likely that the damage was done later, as immobility was established and maintained soon after admission to hospital.

2. The long time which elapsed, thirty-eight days before the occurrence of hemorrhage; in that respect resembling the case of President Garfield, in which the artery ruptured something more than two months after having been grazed by a bullet.

The rational explanation seems to be that the arterial coats were bruised by a section of the ball or a fragment of bone, and might have recovered without rupture, but for the strain thrown upon the bloodvessels by the increased flow of blood incident to the formation of new bone and the repair of the injured tissues.

3. The complication of a serious attack of renal colic.

REVIEWS.

TRAITÉ DE CHIRURGIE CÉRÉBRALE. By A. BROCA and P. MAUBRAC. With 72 illustrations. 8vo., pp. 586. Paris: Masson & Co., 1896.

CEREBRAL SURGERY. By BROCA and MAUBRAC.

ON the whole, the best two books on cerebral surgery, that of Chipault and the present book, are written by Frenchmen. It is to be regretted that, though Englishmen and Americans have cultivated cerebral surgery perhaps more than any other nation, yet for systematic treatises on the subject we must go to Paris.

The book under consideration, like almost all French books, has one glaring defect. There is *no index* whatever, and for a book of nearly six hundred pages, dealing with an immense number, not only of subjects, but especially of details of diagnosis and treatment, this is inexcusable. If, for instance, one wishes to know what the authors have to say on any particular subject, he must hunt laboriously through the "table of contents" for the general subject, and then page after page for the special topic of which he is in search. For consultation, therefore, French books are almost useless. Another fault, which is not infrequent in French books, is the misspelling of foreign names. Thus Eiselberg (p. 120), Stüglitz (p. 120), Stacke (pp. 268, 291, 293, 314), Oyer (p. 388), Parkins (p. 506), Bartolow (p. 564) are misprints for Eiselsberg, Stieglitz, Staacke, Cryer (!), Parkin, and Bartholow, while W. White and L. Dana serve for J. W. White and C. L. Dana.

Having pointed out these two faults, however, which, especially the last, are, of course, of minor importance, we are through with criticism, and can only bestow the highest praise on the book. All in all, it is perhaps the most judicial in its conclusions and complete in its treatment of any book on the subject. Like the work of Chipault, it shows the widest acquaintance with American, English, and German as well as French authors. Scarcely a case that we are familiar with, even in minor American journals, has escaped the eyes of the authors.

The book begins with the anatomy of the convolutions, cranial topography, and cerebral localization. These are followed by the clinical indications for surgical interference, the operative technique, and the dangers of intervention. This constitutes the first part. In the second, Chapter I. deals with traumatic lesions, under which are considered cerebral compression, foreign bodies, paralysis after injury, abscess, headache, and epilepsy following traumatisms. In Chapter II. the intracranial complications arising from disease of the ear are described. Chapter III. treats of tumors; Chapter IV. of hemorrhage, softening, meningitis, cerebral abscess not arising from either injury or ear-disease, and general paralysis. These are followed by chapters on hydrocephalus, microcephalus, epilepsy other than traumatic, psychoses, headache, and encephalocele. This very brief analysis will give our readers an idea of the scope of the work.

In the matter of the topography of the brain the authors are probably right in advocating theoretically a method by proportions; but at the same time they believe that at present other methods by absolute measurements must be the necessary complement of the first. A half-dozen or more methods are described and excellently illustrated. They notice (p. 389) Doyen's temporary exploratory hemicraniectomy, which "permits us to open the cranium as we open the abdomen and to uncover and explore in a case of uncertain diagnosis an entire cerebral hemisphere from forehead to occiput," but significantly add, "there is undoubtedly in this somewhat of an exaggeration" It is, however, undoubtedly useful always to have a large opening. They are, on the whole, in favor of the trephine and the rongeur-forceps, and rather throw discredit on Wagner's temporary osteoplastic resection; a method which is undoubtedly gaining in professional esteem, and which the personal experience of the reviewer favors very much. It is with some little surprise (p. 121) that we observe the authors state "that it has only been employed in relatively rare cases in man."

One bit of advice comes with especial propriety from so well known a surgeon as Broca, namely, that the surgeon should always call in the neurologist for consultation (p. 97). No surgeon, be his skill what it may, in our opinion, is justified (saving, of course, in perfectly plain traumatic cases and the like) in opening a head, for instance, for tumor, abscess, epilepsy, or other similar disease, without the consultation and co-operation of a neurological specialist.

We are somewhat surprised to observe (p. 142) that the authors discourage the search for balls in gunshot-wounds. The tables of Wharton and Bradford and Smith, showing that the cases in which such foreign bodies were removed had a mortality of about one-third, whereas in those cases in which the missile was not removed the mortality was about 54 per cent. to 58 per cent., should convince surgeons that abstention ought not to be the rule. Of course, the surgeon must have the good sense not to interfere in every case; but in the majority of cases, if the ball is within reasonable reach, undoubtedly it should be removed. Contrary to the generally accepted belief and also to the experience, we think, of most surgeons, the authors state that in abscess (p. 326) there is a distinct rise of temperature. So many cases have been reported with a subnormal temperature that we do not think sufficient importance has been given to this otherwise anomalous symptom. In traumatic epilepsy the authors give their judicious approval of operation. This opinion finds, even in focal epilepsy, a strong support in the recent papers of Sachs and Gerster before the American Neurological Association, and seems to us in accordance with sound surgical judgment.

The chapter on the Cerebral Complications from Disease of the Middle Ear is not only full, but admirable. The authors have pointed out with great clearness the dangers of various forms of abscess and of pyæmic thrombosis of the various sinuses. One fact which is not, perhaps, appreciated so much by both surgeons and otologists is, as Allport has recently pointed out (*Journal of the American Medical Association*, 1892, vol. xix.), that other sinuses, especially the superior petrosal, are even more frequently thrombosed than the lateral sinus. Inasmuch as these other sinuses are as yet inaccessible to the surgeon, the importance of the thrombosis has not been sufficiently recognized. We should call attention to the fact, however, that the superior longitudinal sinus is

quite as accessible as the lateral to surgical interference, and that in case of thrombosis of this sinus it should be attacked precisely with the same boldness that the lateral sinus has been. Macewen has reported three such cases in his admirable work. We are glad to see that the authors insist on a speedy and thorough operation in cases of sinus-thrombosis. No halfway measures save life in this form of pyæmia, and we thoroughly agree with them also in the direction that the ligation of the jugular should be the first step of the operation before opening the sinus itself. The great danger in sinus-thrombosis is extension of the clot into the superior vena cava, the heart, and the lungs, hence the first prophylactic step should be the ligation of the vein. The authors have only collected 57 operations for thrombosis (p. 312), with 23 recoveries and 34 deaths, a mortality of 59.6 per cent. The reviewer (*International Encyclopædia of Surgery*, vol. vii. p. 600) tabulated two years ago 86 cases, which quite reverses the figures of the authors, as this table gave 58 recoveries and 28 deaths, a mortality of only 32.6 per cent.

In operating upon abscess of the brain of otitic origin the authors strongly recommend (p. 354) the mastoid route rather than a separate trephine-opening, and we must confess that the reasons they give are very strong. Surgeons, especially English and American, have operated more after Barker's method by second trephine-opening for the temporosphenoidal lobe, and a third for the cerebellum should it be necessary; but, influenced by what is here set forth, we should certainly be disposed to give a test to the mastoid route, especially as it gives access with equal readiness to either a cerebral or a cerebellar abscess.

The chapter on Tumors is excellent and the counsel most judicious. One point in the matter of statistics, which has not perhaps been appreciated by neurologists particularly as much as it ought to be, is that data drawn from autopsies as to the operability of cerebral tumors are fallacious, because they represent the final stage of the tumor when it has reached its largest size, is most widely infiltrated, and has done its greatest damage, whereas, had the tumor been attacked early in its existence, it might have been removed with relative ease. In considering the dangers of extirpating tumors, opening the ventricles is accorded the first rank. A recent case in the experience of the reviewer, in which the lateral ventricle was widely opened (a report of which will soon appear in this JOURNAL), would seem to show that this danger is not so great as has been supposed. In the case referred to, not only was the ventricle widely opened, but it was packed with iodoform-gauze, and the patient made an excellent and speedy recovery without any complication. Cerebral hemorrhage is well treated in accordance with the most advanced ideas. The technique of puncture of the lateral ventricles and of lumbar puncture, as developed by Quincke, and the value of each, are described fully and with conservative conclusions. We are glad to see (p. 576) that they disapprove of the extensive excision of the brain-cortex practised by Burckhardt for psychoses. The procedure does not seem to us rational, the results have not been satisfactory, and operations extending over three to four and a half hours in length are certainly full of the gravest danger. As will be seen, while not always entirely agreeing with the authors, yet we consider their book one of the most valuable that we have read for a long while, and commend it freely and fully to our readers as fully abreast of the times.

W. W. K.

DIE OTOGENE PYÄMIE. Von DR. HUGO HESSLER, Docent der Ohrenheilkunde an der Universität Halle a. s. Pp. 500. Jena: Gustav Fischer, 1896.

OTOGENOUS PYÆMIA. By DR. HUGO HESSLER, Instructor in Otology in the University of Halle.

THIS work of Hessler is the logical and more comprehensive successor of the very valuable treatise upon otitic lesions of the brain and its sinuses, by Forselles, in 1893, and Jansen and Koerner, in 1894 and 1895. Even a cursory reading of this work on otogenous pyæmia will impress anyone with the earnestness, candor, industry, and ability of its author. His endeavor to add something of practical value, based on pathology, to our present knowledge of otogenous pyæmia has been admirably sustained. The work contains chapters on the History of the Literature of Otitic Pyæmia, on Pyæmia in General, the Anatomy of the Ear, Cases and General Statistics, a Summary of the Conditions Found in the Record of Numerous Cases, Pathological Anatomy, Symptomatology, Bacteriology, the Course, Result, and Prognosis, Diagnosis, and Treatment. "The difficulties of diagnosis of otogenous pyæmia, notwithstanding the great additions to our knowledge of this subject, are not diminished." The chapter on Treatment (pp. 447–500) opens with these words: "The treatment most satisfactory to both patient and physician is a prophylactic one." In other words, be careful what you do in the acute stages of the primary ear-disease.

"The general symptoms, high fever, the initial chill, the involvement of the sensorium, in a case of acute otitis media, should lead to the conclusion that the affection will not run a simple course, and we must expect complications. . . . In such cases the inflammatory conditions in the middle-ear and drum-membrane are usually more severe than in simple ones, and extend to the external auditory canal. . . . In such instances simple paracentesis of the membrana tympani is insufficient to prevent retention of pus in the drum-cavity, but a large opening must now be made in the membrana and maintained, in order to prevent a subsequent retention of pus, which may occur in the uncertain course of aural suppuration." Thus drainage is obtained and continued, and retention of micro-organisms prevented. "Inflations by Politzer's method should be avoided, as they tend to force fresh quantities of micro-organisms from the naso-pharynx into the middle-ears, and bring about fresh infection. . . . The treatment of the entire aural suppuration must be *aseptic;* it seems doubtful whether antiseptic treatment is as useful as was once thought," because the remedies thus named have been shown to contain septic germs and to cause secondary infection.

"If osteophlebitis occurs in the temporal bone, in addition to paracentesis of the membrane, the diseased bone must be removed, not only in the region of the tegmen tympani, but also in that of the floor of the drum-cavity and in the hinder and inner wall of the mastoid, in order to explore the sinus and the jugular vein." If relief of symptoms of pyæmia do not follow such operation, and subdural abscess is suspected, "the bone which appears normal externally must be chiselled away, the dura exposed, and the abscess emptied."

If symptoms of thrombophlebitis occur, the surest way to decide "whether or not a thrombus exists in the transverse sinus or in the jugular vein is to make an exploratory puncture in the sinus. . . .

It is not necessary, however, to open the sinus and clean it out on account of the presence of a simple thrombus, as long as the latter shows no disposition to purulent degeneration and the formation of emboli. In the latter instance the sinus should be opened, or any pre-existing fistula in it enlarged, the broken-down and purulent thrombus removed, and double ligation and excision of the jugular vein in the neck performed, in order to effect cleansing of the sinus from this point and prevention of the escape of portions of the thrombus into the circulation."

The result in metastatic cases is less satisfactory than in those without metastasis. Though operations have done much for the relief of otogenous pyæmia, the author deprecates a hasty resort to operations, since in some instances spontaneous recovery of sinus-phlebitis has occurred, and also cases of simple thrombosis have been converted into metastatic ones by the admission of infection to the circulation by the operation.

Though the advances of otology in the past ten years have been great in the treatment of otogenous pyæmia, "much yet remains to be discovered respecting the diagnosis and treatment in order that the true end of any treatment, viz., prophylaxis, may be attained. That is the task of the present, and it is probable that here, too, bacteriology, the youngest department of practical medicine, must point out the way."

It is to be regretted that so valuable a guide as this work is untranslated into English. This fact must be our apology for presenting so many translated quotations from the book. C. H. B.

MEDICAL JURISPRUDENCE, FORENSIC MEDICINE, AND TOXICOLOGY. By A. WITTHAUS, A.M., M.D., and TRACY C. BECKER, A.B., LL.B. With numerous collaborators. Vol. III., pp 697. New York: William Wood & Co., 1896.

THE third volume of this ambitious work is concerned with the following subjects: Vision and Audition in their Medico-legal Relations, the Medico-legal Aspect of Insurance, Insanity in its Relations to Medical Jurisprudence, Mental Unsoundness in its Legal Relations, and the Care and Custody of Incompetent Persons. To the consideration of these five subjects 683 pages of text are devoted, a fact which gives some idea of the magnitude of the entire work, which has both the merits and defects of so many similar "Systems." It is not just to apply to them the criticism of Carlyle on the ready writers—to class them as ever-swelling tides of ditch-water; and yet they impress one with the idea that quantity and not quality, that a redundancy of facts and not a literary form are what is sought for by the editors, contributors, and publisher.

The article by Dr. Edward D. Fisher, on Insanity in its Relation to Medical Jurisprudence, is an excellent presentation of the entire subject of insanity, both in its medical and medico-legal relations. By the omission of the portion pertaining to Medical Jurisprudence, and the addition of sections on treatment, it would serve for a medical treatise on the subject. The paper is carefully written, and will add to the already high reputation of the author as a neurologist and alienist. With the article on Mental Unsoundness in its Legal Relations, a subject which is ably presented by Mr. Becker, one of the editors of the *Treatise*, it fully covers the subject of insanity in its relation to the law. Dr. Fisher

introduces the body of his article with a discussion of the difficulties of the subject, and its most important medico-legal bearings. Here and there throughout the article important medico-legal points are brought out, as when discussing hallucinations, illusions, imperative conceptions, lucid intervals, etc. Mr. Becker's article is rich in its interesting citation of cases. He presents from the legal standpo.nt the relations of insanity to the civil law, the taxation of the property of a lunatic, the statutes of limitation in their application to the insane, wills and testamentary capacity, and the criminal responsibility of the insane. Hypnotism is one of the few subjects which does not seem to have received the full consideration which its recently acquired importance demands.

Goodwin Brown, Esq., New York State Lunacy Commissioner, brings together in convenient shape for general use the statutes and methods of procedure relating to the care and custody of incompetent persons and their estates. Matters of this kind are familiar to members of the legal profession, but not, as a rule, to physicians, who will here find them compiled and conveniently arranged for their use. The methods of procedure in cases of inquisition in lunacy; in cases of petition for a supersedeas, when recovery from lunacy is alleged; the question of costs in lunacy proceedings; of committees and guardians; and of the management of estates, and the care and restraint of persons of unsound mind, are presented with sufficient fulness. The compilation by Mr. Frank H. Gilbert of the digested statutes of all the States relating to the care and custody of incompetent persons and their estates, and the commitment and confinement of insane persons, will be found of great value for reference.

Although this is a work on Medical Jurisprudence, the article by Dr. J. H. Woodward on the Medico-legal Relations of Vision and Audition contains little of a medico-legal character. Excellent descriptions of the eye and its diseases and injuries, of the methods of examination for disorders of refraction and accommodation, and important points in the diagnosis of ophthalmological affections are well presented, but with scant reference, and in some instances with no reference at all, to the medico-legal aspects of the subjects. This criticism does not apply to the descriptions which are given of the best methods of testing simulated blindness, and similar practical matters which come strictly within the province of the medical jurist. The methods of Bravais, Michaud, and others of examining for simulated blindness by means of color-tests are given, and constitute one of the most interesting portions of Dr. Woodward's article.

The article on Insurance, by David Murray, Esq., and Guy J. Edwards, Esq., is a clear presentation of the most important medico-legal facts relating to life and accident insurance. Numerous cases are cited and brought together. The authors adhere to their express determination to confine themselves "strictly to those cases wherein the science of law and medicine must co-operate to elucidate properly the questions involved in determining the nature and effect of the contract between the insurer and the insured."

This volume will prove of most value as a work of reference for physicians and lawyers, and as a mine of information for teachers and writers on medical jurisprudence. The indexed "Table of Cases Cited in the Volume" will be found of especial value in preparing cases for court. The book is clearly printed on good paper. C. K. M.

LECTURES ON APPENDICITIS AND NOTES ON OTHER SUBJECTS. By ROBERT T. MORRIS, A.M., M.D., Fellow of the New York Academy of Medicine, etc. New York and London: G. P. Putnam's Sons, 1895.

DR. MORRIS has put in book-form his lectures on appendicitis, added to which is a series of notes on other subjects. In the first chapter the useful rules are laid down for the preparation of the patient and surgeon preliminary to the operative procedure. Chromic gut is the medium employed for all sutures, except for ligation of the inner tube of the appendix. The author lays considerable stress on the fact that the surgeon must personally attend to the preparation of his own catgut to reach the idealism of aseptic work. He suggests that a fixed standard be established for determining the size of catgut, based upon the American standard wire-gauge. The only irrigation used is the normal saline solution and hydrogen peroxide. Common boiled and distilled water, so generally employed by other surgeons, is regarded as an irritant to the tissues, and is somewhat corrosive in peritoneal operations, as it injures the serosa slightly, and may be sufficient to close the mouths of the lymphatics, upon which so much depends for carrying off septic material.

In the chapter on appendicitis proper the subject is well treated from a clinical and bacteriological standpoint; much stress is laid upon bacterial invasion, and many clear and practical deductions are drawn from them. As we find with mixed bacilli or streptococci, the temperature ascends, and when the latter abound the temperature may go as high as 105°; but when the colon-bacilli assume control the temperature may drop to 100° while the disease is in progress. A colon-bacilli temperature may be normal or subnormal from the onset. The toxins of colon-bacilli do not tend to elevate the temperature, but they do pull the vital tissues apart most insidiously, explaining why we so often find a pulse of 120 and a temperature of 99°. The pulse becomes important when it indicates the degree of intoxication of the sympathetic nervous system, although complete destruction of the appendix may take place without producing much change in the character of the pulse, showing that neither the pulse nor the temperature can be depended upon as indices to the destruction of the appendix proper.

A somewhat graphic picture is drawn of two supposed cases treated, on the one hand, by the usual conservative or expectant method, and, on the other, by early operation on the first day. The contrast as depicted by the author is unquestionably true.

The last chapter is devoted to operative technique, in which much stress is laid upon a one-and-one-half-inch incision, in which the skin has been previously made tense by two tenacula introduced and drawn in opposite directions. This insures a very clear skin-incision, which heals without much scar, while an opening of this length in the peritoneum will suffice for the removal of an uncomplicated appendix. To attempt to follow this rule is inadvisable, often tending to prolong the operation unnecessarily, and especially so when the operator is wedded to a very small skin-incision. Dr. Morris strongly condemns the use of the drainage-tube, as also the plan of packing with gauze. He considers that the best results as to drainage are obtained by the wick-drain surrounded by rubber tissue. Nevertheless, the drainage-tube and gauze-packing have long been in use and have many advocates among surgeons

of extensive experience. A table of one hundred cases is appended, showing that the results in septic peritonitis are as gloomy as those in the hands of other operators.

Many of the plates are very good, being photographic reproductions from sketches by Dr. MacDonald. There is no attempt on the part of the author to make an exhaustive treatise of the subject, he being content to put in a clear and concise form the results of his observations. His extensive experience in this line of work is bound to be treated with respect, and commends itself to all who are interested in the subject, whether viewed from either a medical or a surgical standpoint. The appended notes on other subjects, many of which are most interesting, have appeared in various periodicals, and would have much better, in our judgment, been omitted. The book is well mounted, and is of the highest order of work, reflecting credit upon its publishers. R. H. H.

TRAVAUX DE NEUROLOGIE CHIRURGICALE (1895). Par A. CHIPAULT, BRAQUALAYE, DEMOULIN et DALEINE. 8vo., pp. viii., 352. Paris: Battaille et Cie, 1896.

CONTRIBUTIONS TO SURGICAL NEUROLOGY.

THIS volume by Chipault and his collaborators is both peculiar and useful. It is intended to be the first of a series dealing with the surgery of the nervous system, in which will be gathered together all the work which they may have done in this department year by year. It also includes as addenda to their own work papers written by various surgeons on the same subjects, and gives a *résumé* of each reported case, reproducing all important illustrations, though not always so artistically as we could wish. Each volume will be independent of the others in the series.

The best idea of the book can be obtained from an analysis of its contents. It is divided into three parts: First, the Cranium and Brain; second, the Spine and Spinal Cord; third, the Nerves. Under the first are considered or reproduced some old observations of the cranial surgery of the sixteenth century. This is followed by the consideration of fractures of the base of the skull, pericranial lipomata, the surgical treatment of intracranial tumors, and the surgery of the internal capsule. Under the second the anatomy of the spinal cord, the surgery of Pott's disease, osteoplastic surgery of the spine, surgery of fractures and dislocations, and also ligature and suture of the vertebræ, resection of the nerve-roots within the spinal canal, and lumbar puncture. Under the third, facial palsies of otitic origin, including a case of resection of the canal of Fallopius, the ill-results from the incision of Wilde, lesions of the brachial plexus and the treatment of mal perforant by elongation of the plantar nerves.

It has a list of figures, a table of contents, and an index of names of authors cited, but unfortunately *no index* to the contents of the book.

The book is a most admirable one, especially in gathering together all the cases and observations in certain departments of the surgery of the nervous system, and will save an immense deal of future labor to both surgeons and neurologists.

Few men have done so much work in this department of surgery as Chipault, and one is sure to learn something from each of the many papers from his indefatigable pen and pencil. W. W. K.

AN AMERICAN TEXT-BOOK OF SURGERY FOR PRACTITIONERS AND STUDENTS. Edited by W. W. KEEN, M.D., and J. WILLIAM WHITE, M.D. Second edition. Philadelphia: W. B. Saunders, 1895.

HOWEVER disappointing this text-book may be to a few in teaching, its extraordinary sale and adoption as a text-book are evidences of its popularity.

The additions to the text since the first edition comprise the effect of modern small-arms in military surgery; a new section on Acromegaly; the Hartley-Krause method of removing the Gasserian ganglion; the osteoplastic method of resection of the skull, with a number of additions to operations and methods in endocranial and spinal surgery; in the surgery of the chest, a description of Schede's operation; in the surgery of the digestive tract, Witzel's method of gastrostomy; the use of the Murphy button in intestinal anastomosis; the consideration of retroperitoneal tumors and of castration for enlarged prostate; a chapter on Symphyseotomy; Macewen's method of compressing the aorta in amputation at the hip-joint.

The sections dealing with Fractures and Dislocations, Appendicitis, the Radical Cure of Hernia, and the more recent methods in Amputations of the Breast have been especially enlarged, particularly in the matter of treatment. Displacements of the uterus have also been regrouped and the chapter largely rewritten. Tuberculosis of the testes receives too scant attention. There is space devoted to resection of the liver. In the chapter on Fractures there are too few descriptions of methods. There are too few illustrations of apparatus in position. Orthopedic surgery is confined wholly to deformities. The surgery of the nerves is concise and accurate. The treatment of diseases of the joints is old-fashioned and out of date. The chapter on Diseases and Injuries of the Head is a splendidly written one and fully up to date.

C. L. S.

COLOR-VISION AND COLOR-BLINDNESS. A PRACTICAL MANUAL FOR RAILROAD SURGEONS. By J. ELLIS JENNINGS, M.D. With illustrations. Philadelphia: The F. A. Davis Co., 1896.

THIS little manual, which opens with a historical sketch of color-blindness, discusses the physiological anatomy of the retina, the physics of light, the theories of color-perception and color-blindness, and the various methods for detecting color-blindness. Among these, Holmgren's method, Thomson's adaptation of the colored wools, and Oliver's worsted-test are especially mentioned. The author has devised a worsted-test of his own.

One chapter is devoted to acquired color-blindness, and describes disturbances of the color-sense in connection with diseases of the optic nerves and visual centres. It does not include, as it might have done, reference to the color-sense of hysteric and neurasthenic subjects.

The book concludes with the reproduction of the Pennsylvania Railroad Company's instructions as to examinations for vision, color-blindness, and hearing, and a description of Oliver's series of tests for the detection and determination of subnormal color-perception.

Dr. Jennings has gathered together in a convenient form the essential facts of his subject, and his book will be especially useful to those whose duty it is to make examinations of the color-sense of men employed on railroads and steamboats. Dr. Jennings has consulted most of the standard books on this subject, but the two most important works recently published in this connection have entirely escaped notice, namely, Abney's *Color-vision* and Mauthner's *Farbenlehre*. G. DE S.

STUDENTS' AID IN OPHTHALMOLOGY. By GERTRUDE A. WALKER, A.B., M.D., Clinical Instructor in Diseases of the Eye in the Woman's Medical College of Pennsylvania. With forty illustrations and a colored plate. Philadelphia: P. Blakiston, Son & Co., 1895.

THIS book, according to the author's statement, "is intended for study preliminary to a course of clinical lectures upon the eye, or for reference during attendance upon such course." An attempt to condense within a short space the facts in ophthalmology, or in any other branch of medicine, frequently fails to make clear the most essential portions of the descriptions. The author has not always escaped this pitfall.

In the chapter on Operations there are some curious contrasts: Four lines are devoted to a description of the operation for trachoma, the so-called rolling operation, and nearly a page to tarsorrhaphy, a comparatively infrequent ophthalmic procedure. Here and there are some statements which require modification—a modification which we trust they will receive in future editions; for example, "Sarcoma of the choroid is confined exclusively to adults;" "An injured eye, even if not blind, is always a menace to its fellow, and enucleation should in most cases be advised." But there are many excellent things in this little book, and its arrangement is capital. It is well written in most portions; indeed, it fails to be clear only when the author has been hampered by her lack of space and has been obliged to condense her statements too much. We wish the book and its mission much success. G. DE S.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.D., LL.D.,

PROFESSOR OF MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

The Absorption of Drugs by the Healthy Skin.

Drs. G. Linossier and M. Lannois conclude that volatile bodies, notably those which, in spite of a high boiling-point, possess a certain vapor-tension at ordinary temperature, can be absorbed by the healthy skin in amounts well beyond the usual therapeutic doses. This absorption is regular, subject to invariable laws; for the two drugs studied, guaiacol and methyl salicylate, the dose can be made according to the therapeutic indication as well as if they were to be absorbed by the intestinal tract. Some remedies can thus be employed in massive doses without risking any disturbance of the digestive functions which might follow their administration by the mouth. Apparently methyl salicylate can be administered by the skin as an advantageous substitute for the use of sodium salicylate given by way of the mouth.—*Bulletin Général de Thérapeutique*, 1896, 8e liv. p. 238.

Injections of Calomel for Syphilis.

Dr. Louis Jullien remarks that the subcutaneous method possesses two advantages: The liver and the alimentary mucous membranes are spared. Dilatation of the stomach is frequent in old syphilitics, cirrhotic changes have been noted in the liver, and even hepatic neurasthenia, a variety of syphilitic neurasthenia, may be produced. The vehicle used is liquid vaseline; the dose varies from one to two grains, according to the size of the individual; the locality is preferably the supra- and infra-spinous fossæ of the scapular region; strict asepsis must be enforced, and the interval between the injections varies according to circumstances; it may be from eight to twenty or more days. Among the advantages can be cited the promptitude of its effects, the intensity of its action, and the persistence and positive character of its cures —*Archives Générales de Médecine*, 1896, No. 5, p. 513.

The Use of Iodol in Venereal Disease.

Dr. Domenico Majocchi reports the results obtained from the use of this remedy during the past four years. In venereal ulcers, five hundred and fifty-eight patients, the remedy, alone or with equal amount of calomel, has given the best results. Previous to the application the ulcer must be disinfected and carefully dried. One hundred and eighty-seven cases of infecting chancre, thirty-one of granular erosions of the cervix uteri, and four of vaginal *esthiomene* were also treated. From this extended experience he concludes (1) that since it is odorless it is more acceptable to the patients. (2) It is not poisonous even when spread over extended areas; this is more than can be said of other iodine-preparations. (3) It strongly modifies the ulcerative processes, producing in a short time an antiseptic action, and hastens cicatrization. (4) The present preparations are quite stable and do not give rise to symptoms of irritation.—*Therapeutische Monatshefte*, 1896, Heft 4, S. 201.

The Treatment of Gonorrhœa by Argonin.

Dr. A. Lewin has found that this remedy, a white powder, which is silver-casein, soluble in water up to 10 per cent. on careful warming over a water-bath, destroys gonococci rapidly without producing any irritation. It should be dissolved by warming with water, in 1½ per cent. solution, the amount used in two and one-half drachms, and retained five minutes. Of twelve cases observed, in nine the gonococci permanently disappeared in from two to six days. The secretion which persists after the discontinuance of this drug can be relieved by the use of zinc sulphocarbolate and other drugs. On account of the absence of irritating properties it seems especially useful for the treatment of the early stages of the disease.—*Berliner klinische Wochenschrift*, 1896, No. 7, S. 146.

Thiosinamine.

Dr. Sinclair Tousey believes that this drug possesses positive curative properties in causing the resolution of benign and malignant tumors and the absorption of cicatricial tissue. The process of manufacture is by mixing two parts of oil of black mustard-seed, one part of absolute alcohol, and seven parts of aqua ammoniæ (specific gravity 0.960), warming to 104° F., and after a few hours evaporating over a water-bath. The odors of mustard and ammonia disappear, and on cooling small acicular crystals of a bitter taste and garlicky odor of allylsulphocarbamide or thiosinamine are deposited. These are soluble in diluted alcohol and ether, but decompose in an aqueous solution. The drug is used hypodermatically in a 10 per cent. alcoholic solution, up to one and one-half grains injected into the muscles of the arm and forearm. He concludes that this drug, when given hypodermatically, produces no general symptoms, and, even when long continued, no harmful effects. It acts specifically upon certain abnormal tissues to cause their absorption or conversion into normal tissues. It is of doubtful efficacy in lupus and a variety of skin-diseases; but it is of the greatest possible value in the removal of cicatricial contractures following lupus or any other cause of loss

of substance. The frightful contractures from burns of the neck yield to its action, as cases of ectropion and corneal opacity do. It has a curative effect upon keloid and a palliative and probably curative one in malignant tumors. —*New York Medical Journal*, 1896, vol. lxiii. p. 579.

Eucaine Hydrochlorate.

Dr. Gaetano Vinci has experimented with this drug as a local anæsthetic. Instilled into the eye as a 2 to 5 per cent. solution, complete local anæsthesia is obtained in from one to three minutes, with but slight hyperæmia and slight irritation of the palpebral conjunctiva. The pupil is not dilated, but reacts to light. Its general effect is marked excitation of the entire central nervous system, followed, in toxic doses, by paralysis and death. Although the symptoms are similar to those produced by cocaine, yet this drug is less poisonous. Eucaine causes vascular dilatation, while cocaine produces ischæmia. The changes in the pupils are noted above. Clinical experiments showed that cocaine is preferable in violent inflammatory conditions of the eye, although in others the slight hyperæmic effects of eucaine will be of advantage. The latter in solution is permanent.—*Deutsche Medicinal Zeitung*, 1896, No. 34, S. 388.

Salol and Iodoform.

M. Reynier has used this mixture, which, on heating, becomes liquid, and remains so for fifteen or twenty minutes at the temperature of the body, in irregular cavities, cold abscesses, fistulas, and bone-cavities, for the purpose of obtaining asepsis. Of late he has injected this drug in the treatment of bone-tuberculosis and filled the cavities remaining after curettage with it.

M. Routier would attribute the excellent results rather to the removal of the morbid products than to the drug.—*La Semaine Médicale*, 1896, No. 19, p. 150.

Tribromophenol Bismuth.

Dr. E. Huess has used this remedy for nearly three years, and has found it to be a most valuable antiseptic for wounds. This drug contains 49.5 per cent. of bismuth oxide and 50 per cent. of tribromophenol, the latter possessing a much stronger antiseptic action than phenol itself. It is readily decomposed into its constituents by strong acids and alkalies, and particularly by heat. It has a slight phenol odor, is tasteless and almost non-poisonous. When used upon external wounds and ulcerative surfaces the definite results obtained were the checking of suppuration, less sensitiveness, limitation of inflammation, and rapid healing. Fresh and non-infective wounds healed aseptically and without reaction. For burns it appeared to be equal to iodoform in quieting the pain. The explanation of its action is that the alkaline fluids found in the tissues decompose the drug, the tribromophenol then acts upon the micro-organisms, while the bismuth is an antifermentative and drying agent. In consequence of its slow decomposition a constant action is kept up and the wound is kept aseptic. Since this remedy does not markedly promote granulation, it may be necessary at first to make

use of iodoform. In conclusion, it may be said that this drug is non-poisonous, odorless, tasteless, entirely non-irritating, promotes epithelial growth and lessens pain, is unchangeable on exposure to light and heat (up to 255° F.), and is powerfully anti-bacterial and anti-fermentative. It appears to be worthy of being placed by the side of iodoform, while possessing some advantages over it.—*Therapeutische Monatshefte*, 1896, Heft 4, S. 214.

Two Cases of Heart-disease Treated by Saline Baths.

Dr. G. V. Poore states that the baths used contained four pounds of sodium chloride and six ounces of calcium chloride to forty gallons of water. The temperature of the baths was 95° F., and the time of immersion in every instance was limited to eight minutes. (1) Aortic obstruction and insufficiency; murmurs exceptionally loud. The area of cardiac dulness was invariably diminished after the bath, and both the transverse and vertical measurements proportionally decreased; the character of the murmurs was unchanged. Whether the improvement which took place was due to the rest in bed or to the bathing, or to both, is a matter of doubt. (2) Aortic obstruction and insufficiency. After each of the four baths the area of cardiac dulness diminished both vertically and transversely, and at the time the patient left the hospital the position of the apex-beat had undergone no permanent change.—*British Medical Journal*, 1896, No. 1845, p. 1139.

The Lime-treatment of Diabetes Mellitus.

Dr. Karl Grube has treated fourteen patients with forms of calcium, generally as phosphate and carbonate. This treatment has apparently no effect upon the excretion of sugar, but the patient feels better and increases in weight. Of these patients there were young subjects who were markedly benefited. Upon the others there was no result. The treatment, however, produced no detriment.—*Therapeutische Monatshefte*, 1896, Heft 5, S. 258.

The Therapeutics of Rheumatism.

Dr. E. H. King, basing the pathology of the disease upon deficient excretion of uric acid and possibly of other toxins, looks upon elimination as the keynote of treatment. At the outset a good dose of calomel should be followed by the saline cathartics. The most useful remedies are salicin and the salicylates. Of the first, thirty grains may be given hourly until an ounce has been consumed, and every two or three hours until the second ounce has been taken; after this the same dose thrice daily for a week or ten days to prevent relapse. The salicyl-compounds are of recognized value in relieving pain and in favoring the excretion of urea. Experience with the salicylates alone or with salophen has not been satisfactory, nor given any marked results over a generally eliminative treatment. In chronic rheumatism potassium iodide is of value as a stimulant to the glandular system, thereby promoting the excretion of urea, and by its reconstructive action tends to reestablish a physiological metabolism.—*Journal of Practical Medicine*, 1896, No. 11, p. 441.

The Treatment of Iodism.

Dr. Briquet recommends the use of extract of belladonna, one to two grains daily, in order to avoid the nasopharyngeal symptoms. Sodium bicarbonate in dose from ninety to one hundred and eighty grains seems to benefit the general manifestations of the poisoning. There is some probability that if administered at the same time with potassium iodide the latter would be converted into the sodium salt and its therapeutic effect weakened. Sodium chlorate in daily dose of ninety grains has been recommended, but no statement is made as to its value. The employment of salol in obtaining intestinal antisepsis promised good results, but further experience has shown that the method is uncertain. Sulphanilic acid in from forty to sixty grains *per diem* will fix the nitrous acid, which, remaining in a free state, would decompose the iodide. In addition, a diet poor in nitrates, as milk, bread, and meats, should be insisted upon. Morphine possesses, as its only recommendation for this purpose, the diminution of gastric irritation. Antipyrin, besides diminishing the urine, is entirely untrustworthy. For the eruptions, antisepsis of the skin is important; baths and lotions of lime permanganate (1 : 25,000) are useful. The best method, however, is the preventive. Always commence with a small dose (seven grains), and gradually increase the amount. Large quantities of milk and even diuretics are prescribed with the drug. The fault is in this instance in diminishing its therapeutic action in facilitating elimination, which frequently is already too rapid. Of particular accidents, hemorrhage should be treated by ergotin, salivation by potassium chlorate, œdema of the glottis may necessitate tracheotomy. Frequently the symptoms which arise in its early use may disappear entirely, even if the drug be continued.—*La Semaine Médicale*, 1896, No. 18, p. 137.

Dr. Calomenopoulo found that in the case of an old syphilitic who was absolutely intolerant of the potassium salt, even when given in small doses, when ninety grains of sodium chlorate were given each day it was possible to administer forty-five grains of potassium iodide without any untoward symptoms. This was continued for about forty days.—*Journal des Praticiens*, 1896, No. 18, p. 288.

The Therapeutics of Diseases of the Heart.

Dr. W. H. Thomson believes that the treatment must be determined chiefly by the consideration whether the affection be primary or secondary in its causation. In the treatment of primary affections the first indication is the prophylaxis of rheumatism. Particular attention should be paid to the tonsils, and prompt use of the salicylates internally should be made at the first signs of tonsillitis, together with local applications of tincture of iodine. The habitual employment of hot-water douches, with oil of peppermint, to the throat is an excellent measure. Rheumatic patients should always protect the skin with flannel, both by day and by night. Rest in bed is of great importance in the primary affections. When the symptoms are rather aggravated by digitalis, strychnine, and similar drugs, aconite will often lessen the dyspnœa, relieve the anginose attacks, and make the pulse fuller and steadier. In dyspnœa the result of adhesive pericarditis firm strapping of the right side of the chest is of undoubted service. For the dyspnœa of

mitral stenosis, especially when it occurs in paroxysms, belladonna in combination with compound spirit of ether is much the best remedy. In mitral stenotic cases digitalis is often inferior to strophanthus, sparteine, or caffeine. Anæmia should always be considered, but the administration of iron is mischievous in rheumatism. In this disease the best remedies are cod-liver oil with small doses of arsenic, or calcium sulphide in from one-half to one grain doses four times daily apparently hastens the convalescence from acute rheumatism. In secondary disease of the heart one should consider the whole circuit of the circulation. The remedial agents may be divided into the constitutional and symptomatic. Of the first class, and the most important and continuous in its operation, is fresh air. Iron is the most effective among drugs, because it is our respiratory food, and has no other function in the body but as the carrier of oxygen. Next to continuous breathing in the open air is properly applied massage, especially that form in which the patient exerts a carefully regulated resistance to the flexion and extension of his muscles by the operator. The nature and seat of the peripheral obstruction which reacts upon the heart will modify the symptomatic medication. In the vicious circle of dilatation of the right heart, with resultant dropsy, due to chronic bronchitis, the heart-affection is one of the most curable if one can cure the bronchitis first. In such cases hours spent in a dry, equable air help the weakened bronchial muscles and the weakened right ventricle as well. Among medicines, tincture of ferric chloride with strychnine does more good to the cough than any cough-mixture. Here, also, arsenic and potassium iodide are useful. The most serious of secondary cardiac diseases are those dependent upon arterial disease. The rapid pulse of secondary cardiac dilatation should be treated by digitalis and not by aconite. In secondary cardiac dilatation digitalis takes the lead of all other drugs; but it should be administered with nitroglycerin, which, by dilating the arterioles, enables us to ease the heart of the peripheral obstruction, against which it had to contend before, on account of the increased arterial pressure caused by the digitalis. Digitalis also causes much gastric disturbance. When much dilatation obtains with cardiac arhythmia, general dropsy, and pulmonary œdema, the infusion in ounce-doses four times daily should be administered for two or three days; then the permanent dose of a half-grain of the powder may be given thrice daily with benefit for a long time. Prior to these smaller doses and during the administration of larger doses, calomel, in a dose of from one-half to two-thirds of a grain thrice daily, is of very great benefit; but it should be discontinued at the first signs of mercurialization. As a modification of the digitalis-treatment, equal parts of the tincture of strophanthus nux vomica, and digitalis may be given in twenty to thirty drops of the mixture thrice daily, particularly in aortic regurgitant and mitral stenotic cases. In chronic interstitial nephritis the high tension of the pulse and the low specific gravity of the urine seem to be favorably affected by small doses of corrosive sublimate. In cerebral derangements short of apoplexy both the cerebral and cardiac affections seem to be improved by a pill containing two-thirds of a grain of sparteine sulphate, one-half grain of powdered digitalis, and one-twenty-fourth of a grain of corrosive sublimate. In all cardio-renal cases with extensive dropsy a milk-diet should be avoided. Opium is a powerful heart-stimulant, and in nocturnal dyspnœa chloral is of great advantage.—*The Medical Record*, 1896, No. 1335, p. 793.

The Influence of Atropine upon the Respiration.

Dr. Unverricht notes that under the influence of this drug the respiratory volume diminishes (after the first injection 3.2 to 18.3 per cent., after the second 4.2 to 11.5 per cent.) and that later the volume rises; but this later rise is when there is exhaustion of the nervous respiratory apparatus, and this is a terminal symptom. As for the frequency of respiration, there is a striking constancy. When the respiratory volume changes it is from changes in the depth of the respiratory act.—*Berliner klinische Wochenschrift*, 1896, No. 24, S. 533.

Anti-tuberculous Serum and its Antitoxin.

Dr. C. Maragliano states that his serum contains specific antitoxins which neutralize, both with animals and with men, the principal toxins of tuberculosis. *In vitro* it is a bactericide for tubercle-bacilli. This is shown by heating normal horse-serum to such temperature and for such time as is necessary to destroy its natural bactericidal power. On inoculating this and the Maragliano serum with tubercle-bacilli the former shows a development of bacilli; the latter remains sterile. The preparation is as follows: The purpose is to inject into the animals which are to furnish the serum the toxic substances which can be obtained from the very virulent cultures of human tuberculosis. The first group is obtained by concentration over a sand-bath at a temperature of 212° F.; then by filtration through a Chamberland apparatus, according to the method employed for the preparation of tuberculin; this contains the proteins. The second is obtained by the Chamberland filter, the culture not being heated, and concentration in a vacuum at the temperature of 86° F.; this contains the toxalbumins and a small quantity of protein. Three parts of the first and one of the second are injected into horses in proportion to body-weight, one to five hundred thousand, and increased each day by one-half the original dose until twenty to twenty-five times that dose is reached. This maximum dose is daily injected for six months, when immunity is reached. The treatment is now suspended for three or four weeks until all of the toxic materials which have been injected are no longer in the circulation. The immunized animal is now bled and the serum prepared by the method which is used for the other therapeutic serums.—*Il Policlinico*, 1896, No. 10, p. 213; and *La Presse Médicale*, 1896, No. 47, p. 273.

The Treatment of Pharyngeal Tuberculosis.

Dr. Robert Levy believes that in the treatment of this condition especial stress should be placed upon prophylaxis. Recognizing the ease of local infection, much attention should be paid to the treatment of catarrhal affections of the upper air-tract and the proper hygiene and disinfection of the mouth and pharynx in tuberculous subjects. Maintaining a healthy epithelial surface is of much value in offering the greatest resistance to the attack. As to local curative remedies, silver nitrate (1 to 12) is of service early in the attack, when the ulcerations are few and small. Curettement and lactic acid, iodoform, and menthol in oil, have given some satisfaction. The galvano-

cautery has been of more service than any other agent, both for cure and palliation. Cocaine-spray and iodoform and morphine insufflation are valuable for home-treatment. General treatment should not be neglected, while anti-syphilitic medication should be carefully followed out in cases of mixed infection. Here experience teaches us to depend upon mercury more than upon potassium iodide; the latter should be given in smaller doses and with caution.—*Denver Medical Times*, 1896, No. 12, p. 496.

The Serum of Marmorek in Scarlet Fever.

M. Josias has made use of two kinds of serum, the one from the sheep and the other from the horse. In the first series forty-nine children were injected with an average dose of about a drachm, with no resulting accident save some urticarial eruptions. In the second ninety-six children received from two to eighteen drachms, resulting in various complications, among which were streptococcal abscesses, lymphangitis, and polymorphous eruptions. With sheep-serum the mortality was 2.08 per cent.; with that of the horse 5.31 per cent.; whereas with the classical treatment it was 5.81 per cent. There were no serious results—albuminuria, temperature, or evolution of the disease. The serum apparently acts upon non-suppurative streptococci in contrast to its absolute failure in suppuration.—*La Presse Médicale*, 1896, No. 42, p. ccxl.

Infantile Tuberculosis Treated by the Serum of Maragliano.

Dott. Cesare Cattaneo reports two cases: In the first there was distinct improvement; the fever disappeared, the weight increased as well as the amount of hæmoglobin, the liver and spleen diminished in size, and the number of white corpuscles diminished. In the second the results were much less favorable. However, these two cases demonstrate the harmlessness of the serum.—*Gazetta degli Ospedale e delle Cliniche*, 1896, No. 32, p. 331.

The Serum-treatment of Articular Rheumatism.

Dr. Jules Weiss has treated ten patients by injecting the serum obtained by bleeding patients who had recently undergone an attack of acute articular rheumatism. His conclusions can be stated only in a general way, because reaction from the injection was variable, not only for each patient, but even for each injection. This treatment cannot be said to have a specific therapeutic value, because, for all that in some cases the cure followed two or three injections of serum, in others—in fact, in the majority—it was necessary to resort to the use of salicylates. Twenty-two injections were administered. In nine cases there was an amelioration of the swelling and pain. Twice there were both subjective and objective relief at the end of three hours. In others this appeared only at the second day. In five cases there was no relief until after the second day. In six the morbid process was not at all modified, while in three there was a distinct aggravation. The quantity of serum which was injected varied from one and one-half to two and one-half drachms. In two cases only were four and one-half to five drachms used. In the three cases last mentioned an articular rheumatism of a torpid type

became, after the injection, an acute polyarthritis of an inflammatory type. For comparison, in two cases of polyarthritis, injections of somatose, which contains 84 to 86 per cent. of albumose, were employed. One received three and the other two injections. These injections were followed by an immediate modification of the articular process, namely, diminution of swelling and pain. This, however, was but temporary.—*Revue de Thérapeutique*, 1896, No. 11, p. 325.

Resorcin in Dermatology.

Dr. M. B. Hartzell believes that this drug possesses keratoplastic and decided sedative properties, the latter making it a valuable application in the large class of diseases in which itching and burning are prominent and often extremely annoying symptoms. Although supposed to be too irritating to be of use in eczema, yet in many of the milder forms it often proves extremely serviceable in allaying the pruritus and diminishing the hyperæmia; in the oozing forms, when the inflammation is not too acute, it often acts most happily in diminishing the discharge and favoring the speedy formation of cornified epithelium. Many cases of erythematous eczema will recover under the judicious use of this remedy alone. It does best when used in watery solutions of the strength of from ten to fifteen grains to the ounce; rarely is it necessary to use stronger ones. Ointments are far more apt to irritate. The addition of ½ per cent. of sodium chloride seems to increase the sedative effect of aqueous solutions, possibly by favoring the absorption of the drug by the skin. It is thus absorbed in considerable quantities, as is shown by a marked greenish discoloration of the urine, which, however, never appears unless salt is added to the solution. As a parasiticide, a paste of resorcin, two to three; lanolin, vaseline, powdered zinc oxide, and powdered starch, of each four parts, has been efficacious in the treatment of favus. The various forms of trichophytosis have been markedly benefited by an ointment containing thirty to forty grains to the ounce. Although this is not superior to other remedies of this class, it has the advantage of being cleanly. In tinea versicolor an alcoholic solution of twenty to thirty grains to the ounce may be painted over the affected area with a camel's-hair brush, nightly, until desquamation takes place. If the cure is then not complete, it may be repeated a second or third time.—*The Therapeutic Gazette*, 1896, No. 6, p. 363.

The Effect of Exercise upon the Excretion of Uric Acid.

Dr. Edward Laval has carefully studied this much-debated question, basing his conclusions upon his observations of nine persons, differently employed, but upon the same (a mixed) diet. He believes that we should attribute the same importance to physical exercise as to the other secondary influences upon which the regular functions of life depend—such are the breathing of relatively pure air, the ingestion of a certain quantity of water, and rest of body and mind during a certain number of hours. If it were proved that exercise diminishes the excretion of uric acid, it would be logical to prescribe for gouty patients various forms of exercise—a method of treatment not likely to be successful.—*Revue de Médecine*, 1896, No. 5, p. 384.

MEDICINE.

UNDER THE CHARGE OF

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Presence of the Typhoid Bacillus outside of Typhoid Patients.

Remheifer and Schneider, working with Elsner's medium, have recently made a number of experiments with water, soil, and fecal material from non-typhoid subjects in order to determine whether the typhoid bacillus could be isolated from them.

Thirty-six specimens of water from different parts of the country were examined, and eight of them contained bacilli which, morphologically and culturally, resembled the typhoid bacillus. They all presented besides these characteristics the property which has been spoken of since the work of Pfeiffer as "glabrification"—*i. e.*, an animal which, under usual circumstances, would succumb to their inoculation, could be protected against them by a typhoid antitoxin. In two cases the water came from places in which typhoid was then present, and in five others typhoid had been present in the place from which the water came only a few months previously.

Ten earth-cultures showed the same bacillus six times.

Finally a bacillus identical with Eberth's bacillus was found in the stools of three individuals not suffering from typhoid (leukæmia, malaria, Bright's) and who had never had the disease. In five other patients a negative result was obtained. Of the eighteen organisms obtained from these different sources twelve were pathogenic for animals, and the animals could be protected against a fatal issue by the use of an antityphoid serum.

The authors think that these researches throw some light on the general etiology of typhoid and point to the possibility of autoinfection. They point out at the same time that there are numerous organisms which closely resemble the typhoid in all the locations mentioned, but which do not possess the property of glabrification.—*Comptes Rendus de la Société de Biologie*, July 24, 1896.

The Urine in Hypertrophic Pulmonary Osteo-arthropathy.

Guérin and Étienne have recently examined the urine from a well-marked case of the above disease with particular reference to the quantity of lime, urea, magnesia, and phosphoric acid excreted.

The authors found that over a period of three or four months, in which they examined the urine almost daily, marked deviations from the normal were present.

The quantity of lime excreted reached to double the normal on many days over the period of four months, but after that time diminished and became less than normal. The quantity of magnesia excreted did not vary notably. The quantity of phosphoric acid has always been extremely low, and urea was present in minimum normal quantities. The authors think these examinations prove that during the first period of the disease the bony system becomes partly decalcified, and this partly explains the deformity in this disease.

The articular enlargements they explain as due to a secondary ossification following the primary process, and in which only a minimum amount of lime is excreted, as shown by their examinations.

The authors point out that this disease not only has characteristics of its own, but also has others common to itself and acromegaly (the spinal curvature), and itself and arthritis deformans (joint-deformities), and theorize as to whether it is a separate disease or a transition-stage between the rheumatic arthropathies and Marie's disease.—*Archives de Médecine Expérimentale*, July, 1896.

Basedow's Disease.

C. Gerhardt makes some suggestive remarks on the nature of Basedow's disease in the course of a short article on the condition of the arteries in that disease (*Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie*, Bd. i. Heft 2). He calls attention anew to the pulsation of the spleen and liver, which he has observed in a number of cases, a phenomenon of importance in distinguishing between mitral insufficiency and Basedow's disease.

Gerhardt looks on the thyroid theory of the cause of the disease as inadequate. He thinks strong emotional disturbances are the most common causes. These affect the brain in such a way that vascular disturbances result. Sooner or later substances are set free in the blood, perhaps largely from the enlarged and overnourished thyroid, and these cause a principal part of the other symptoms, as, for example, the nervous ones. So it is easy to understand how removal of the gland frequently causes improvement, evidently without removing the disease, nor is it likely that organic changes can be found in the brain in a disease of this kind.

Trichocephalus as a Blood-sucking Parasite.

Askanazy has demonstrated that the common whip-worm does not live on the contents of the alimentary canal, as generally supposed. By a careful examination of fresh specimens he was able to convince himself that the narrow end of the worm buries itself in the mucous membrane. Serial sections show that the worm really bores its way through the mucosa, often in a tortuous manner. In the intestine of the worm Askanazy proved that the brown pigment, formerly thought to be derived from the feces of the host, gave the iron-reaction and therefore was derived from hæmoglobin. The objection that the œsophagus of the worm is too narrow for the passage of red corpuscles Askanazy showed to be erroneous. In some sections the lumen of the œsophagus had a diameter of ten millimetres. That organ is, moreover, elastic, and this, with the well-known ability of blood-corpuscles

to slip through relatively narrow openings, makes it clear that there is no mechanical obstacle to the swallowing of blood by the parasite. The author found that the worms were imbedded in the mucous membrane in greater proportion in cases examined soon after death. These observations make clear the cause of anæmia in certain reported cases of trichocephalus-infection. That anæmia is not more frequent is probably due to the fact that usually only a few parasites are present.—*Deutsches Archiv für klin. Med.*, Bd. lvii. Heft 1 und 2.

A Pulmonary Valve with Four Segments.

Virchow recently demonstrated before the Berlin medicinische Gesellschaft (*Berliner klin. Wochenschrift*, 1896, No. 30) a hypertrophied heart of unusual origin. It was obtained from a man, fifty-six years old, who had evidences of chronic endarteritis, though not to a sufficient extent to account for the hypertrophy, and at first sight no explanation was visible. Both ventricles were hypertrophied; in the wall of the right ventricle some of the trabeculæ had the thickness of a finger. The pulmonary conus was dilated, as was the pulmonary artery itself. The valves were somewhat thick, and one of them showed a curvature which must have caused insufficiency. A fourth segment was found, somewhat concealed by the others. It had its own sinus of Valsalva. This congenital anomaly with its accompanying insufficiency explained what was otherwise an "idiopathic" hypertrophy.

Bacteria in the Urine in Non-bacterial Febrile Disease.

Chvostek and Egger (*Wiener klin. Wochenschrift*, 1896, No. 30) report the occurrence of bacteria in the urine in the paroxysms of malaria and in fever produced by injections of tuberculin. As the experiments were conducted in such a way as to exclude the usual causes of error in such observations, and were positive in a greater proportion than is the case in normal subjects, the authors believe that fever serves in some way to favor the excretion of micro-organisms, though no bacterial disease in the usual sense exists. They suggest that this may be simply the exaggeration of a process which must occur at times in healthy persons. Bacteria at times gain entrance to the blood, perhaps most frequently by way of the lymphatics, and are finally excreted with the urine. These germs are probably more or less lowered in vitality, so that they cannot often be cultivated successfully, but in fevers, such as the authors worked with, the excretion is more rapid. These and other observations show that the occurrence of non-specific bacteria, especially the staphylococcus albus, in the urine cannot be looked upon as of great importance, and that other facts must be advanced in order to prove their relation to disease present.

The Preservation of Urinary Sediments.

Gumprecht (*Centralblatt für inn. Med.*, 1896, No. 30) gives a new method for the preservation of urinary sediments, which seems *à priori* to have a number of advantages over other methods. The urine is centrifugated, so as to form a compact sediment. The tubes should have bulbous extremities

in order to make safer the subsequent procedures. If blood is present, the sediment, after careful decantation, is shaken up with saturated sublimate solution and centrifugated again, the sublimate decanted, and the sediment washed in the centrifuge six times with water or physiological salt-solution. After this, which may be dispensed with if there is no blood and but little albumin present, formol, in a solution of 2 to 10 per cent., is poured over the sediment, which then remains as a nubecula.

Gumprecht has preserved sediments in this way for a year with excellent results. Casts, cells of various kinds and in various stages of degeneration, red blood-corpuscles, and bacteria are well preserved and may be examined unstained or stained. Degenerated red blood-corpuscles, according to the author, are especially well preserved.

Anthracosis of the Urine.

Betz (*Memorabilien*, xxxix. Heft 6) reports the case of a stovemaker who for a long time cleaned stoves in which anthracite coal had been burned and who acquired bronchitis. While under treatment the urine suddenly showed a black sediment which disappeared after four days. The sediment could easily be mixed with the urine, but settled rapidly on standing as a fine powder, leaving the supernatant urine clear. Chemical and microscopic examination showed the sediment to be composed of anthracite coal-dust. The sputum was free from this.

The Influence of Antisyphilitic Treatment in Preventing Certain Diseases of the Nervous System considered of Syphilitic Origin.

Collins publishes an important article on this subject from the clinic of Professor C. L. Dana (*The Post-Graduate*, vol. xi. No. 7). The diseases investigated were tabes dorsalis, cerebral thrombosis (exudative syphilis), syphilitic spinal-cord diseases, and general paresis, from hospital and private practice. Seventy-five per cent. of the tabes cases gave a clear history of syphilis, and in some others there was a suspicious history. Twenty-five cases of hemiplegia were selected because of the history of syphilis and the absence of other etiological factors. Out of fourteen cases of general paresis syphilis was denied in four. The other clinical details should be read in the original. The author's summary is as follows: 1. Exudative and degenerative diseases of the nervous system, due to syphilis, are most liable to show themselves at the end of the third and beginning of the fourth decade of life. 2. Thorough and prolonged administration of antisyphilitic remedies during the activity of the virus does not seem to prolong materially this time-limit. 3. Active and prolonged antisyphilitic treatment does not seem to prevent the development of such diseases as locomotor ataxia and general paresis; and cases in which syphilis is confessed and in which treatment has been most desultory and incomplete are not more liable to the earlier development or of the severe manifestations of either of these two diseases than those in which the treatment has been all it should be. 4. The administration of antisyphilitic measures in the most approved way does not fulfil the requirements of cure, and syphilis is often an incurable disease. [The number of

cases seems too small to warrant some of the conclusions, which are nevertheless valuable as representing the personal opinion of the author.]

The Simulation of Opium-poisoning by Acute Lesions of the Pons.

Dana (*The Post-Graduate*, vol. xi. No. 7) reports the following: A man, forty-nine years old, had been subject to worry and business anxieties for a long time. A year before the final disease he had a number of attacks of palpitation with anginal symptoms. Falling from the steps of a train he was struck on the back of the head, was dazed, and the next day had, apparently, an epileptic attack without paralysis. A month later he had a fainting-spell, became profoundly unconscious, with pinpoint-pupils, respiration one or two a minute, and absent radial pulse. The heart was beating irregularly at about seventy; the extremities were cold. With stimulation and artificial heat the respiration increased to four, but soon ceased entirely, very suddenly. After artificial respiration for a quarter of an hour breathing began again and at the end of five hours became normal. The pupils were normal and consciousness partially restored. Active delirium then began, lasting three days. After that ceased and the patient became rational persistent hiccough came on. There were evidences of arterial degeneration and weak heart. Had the patient died early in the attack the medical evidence of opium-poisoning would have been very strong, yet this could be positively excluded. Evidently there was acute softening or anæmia of the pons, which simulated opium-poisoning just as hemorrhage of the pons does. (The high temperature of hemorrhage was absent in this case.) Cases in which the mistake has been made are reported by Wilks, Fagge, and others. In some instances of hemorrhage the stomach has been washed out and antidotes administered.

Klumpke's Paralysis.

Heubner reports three cases of this interesting disease, all in children. In one case there was an osteosarcoma in the region of the seventh cervical and first dorsal vertebræ, with internal metastases, causing atrophy of the corresponding nerves at their exit from the intervertebral foramen. In this case there were the following symptoms: Paralysis and atrophy of the interosseous muscles of the ulnar side of the right hand, with claw-fingers; the electric excitability of the muscles reduced; no reaction of degeneration; the right eyelid and pupil narrowed; the pupil reacted well to light; the lid could be raised voluntarily. There were no vasomotor symptoms. Shortly before death paresis of the lower limbs and retention of urine, with incontinence, came on. The second case was one of caries of the seventh cervical and first dorsal vertebræ. The symptoms were much like those of the first case, but the muscles supplied by the radial nerve were involved more than those innervated by the ulnar, and gave the reaction of degeneration. In the third case there was no autopsy, but the symptoms were like those in the other two. In all three cases there was the paralysis of the arm, with the peculiar ocular symptoms. The latter are explained by the implication in the vertebral disease of the communicating branch of the first dorsal nerve,

which, as Miss Klumpke showed experimentally, carries fibres from the cilio-spinal centre to the smooth muscular fibres of the orbit and pupil.—*Charité Annalen*, Bd. xx. p. 280.

Cerebral Spastic Paralysis in Childhood.

H. Ganghofner (*Jahrbuch für Kinderheilkunde*, 1895, Bd. xl. Heft 2 und 3) calls attention to the possibility of hydrocephalus in the spastic paralysis of children, as Strümpell first pointed out. Three cases under Ganghofner's observation died of intercurrent disease. In the first case there was hydrocephalus with increased thickness of the ependyma, but otherwise no notable change. In the second case there was marked hydrocephalus with reduction of the cortex, and, microscopically, atrophy and sclerosis of the pyramidal tracts in the medulla and the cervical dorsal cord. In the third case there were imperfect development of the olfactory tracts, slight internal hydrocephalus with moderate thickening of the ependyma, dilatation of the central canal from the lower cervical region to the cauda, with thickening of the substantia gelatinosa centralis. Ganghofner explains the spastic and paretic phenomena in such cases by mild changes in the cortex or functional lack of development of certain parts, so that the cerebral inhibition of the spinal reflexes is lost.

The Etiology of Epidemic Cerebro-spinal Meningitis.

Recent observations in Germany direct our attention again to this subject, and, thanks to Quincke's lumbar puncture, promise a valuable means of diagnosis.

Weichselbaum described, nine years ago, an organism which he called diplococcus meningitidis intracellularis. Little attention was paid to this, the diplococcus pneumoniæ seeming to most investigators to be the cause of epidemic meningitis, notwithstanding many objections to that view. Recently Jaeger (*Zeitschrift für Hygiene*, Bd. xix.) in Stuttgart has again found the former organism in epidemic meningitis. In the spring of 1895 Heubner (*Deutsche med. Wochenschrift*, 1896, No. 27) found the same microbe in the fluid from lumbar puncture in a case of epidemic cerebro-spinal meningitis. Later this was confirmed by Heubner and Finkelstein in eight cases, the diagnosis of cerebro-spinal meningitis being confirmed by autopsy in all the cases except three—one of which recovered, and in the others autopsies could not be made. Comparison with Jaeger's preparations proved the identity of the organisms. Both Weichselbaum and Jaeger failed in their efforts to inoculate animals, but Heubner was more successful, and in two goats obtained positive results. The experiments showed also that the meningococcus is less virulent than the pneumococcus, thus agreeing with clinical and epidemiological observations. Pneumococcus meningitis is usually rapidly fatal, but in the epidemic disease only from a third to a half of the cases die, and of these many have a protracted course.

Important additions to the knowledge of this microbe have been made by Fürbringer (*Deutsche med. Wochenschrift*, 1896, No. 27). A young man was admitted to his wards with symptoms of meningitis and recent gonorrhœa. Lumbar puncture gave a purulent fluid, some of the cells in which contained

microbes resembling gonococci. The patient died, and the autopsy revealed cerebro-spinal meningitis with an old tuberculous lesion of the lung. Examination showed that the diplococci in the meningeal fluid were in reality meningococci, the gonorrhœa being simply a coincidence.

The differential diagnosis of the two cocci was made the subject of special investigation by F. KIEFER, of Berlin (*Berliner klin. Wochenschrift*, 1896, No. 28). It is enough here to state that, although the organisms are much alike, the meningococci vary more in size among themselves than the gonococci. The arrangement in the cells is much alike in both cases. Both decolorize by Gram's method. The meningococci, however, grow rapidly in glycerin-agar—a fact of great value in the diagnosis of cerebro-spinal meningitis by the aid of spinal puncture.

Kiefer was unable to inoculate guinea-pigs and rabbits, but while carrying on his observations he had rhinitis with marked depression, headache, nervousness, and a drawing-pain in the neck. The pus from the nose showed cocci similar to those in the cultures, and these soon overcame the other bacteria of the nose, appearing almost in pure culture. Kiefer concludes that this observation shows the great infectiousness of the meningococcus; the fact that the nose is the usual entry of the microbe; that infection does not always follow a course identical in virulence with the original material; and that the meningococcus has perhaps been mistaken for the gonococcus in some cases of purulent disease of the nose, ear, and meninges—an error difficult to avoid in the absence of cultures.

WHEAT-STARCH IN THE BRONCHI.

C. GERHARDT reports the case of a baker, working much in flour-dust, who was taken with pain in the left side, cough, dyspnœa, and pain in the thighs. There was dulness on percussion over the right apex, most marked posteriorly, increased vocal fremitus, harsh respiration, and numerous râles. The sputum had a remarkably milky appearance, like starch-paste. It was therefore treated with dilute iodine solution, in which it became blue. The microscope showed formless and cylindrical masses in the sputum, made up of round-cells and starch-granules. Starch could not be found in the nose, mouth, or larynx. Expectoration of starch persisted for two and a half weeks after the patient gave up his work. Gerhardt, who found expectoration of starch in three other bakers, suggests that the starch retained in the bronchi may have some relation to the asthma of millers and bakers.—*Centralblatt für innere Med.*, 1896, No. 20.

THE ETIOLOGY OF GENERAL PARESIS.

From the analysis of two hundred cases in Krafft-Ebing's clinic (*Wiener klin. Rundschau*, 1895, No. 45) HIRSCHL comes to the conclusion that syphilis is the chief cause of general paresis, even going so far as to call the disease *encephalitis syphilitica*. The average age of the patients were forty-five and one-half years. Four were under twenty, two over sixty. The proportion of men to women was three to one. Heredity seemed to be concerned in 11 per cent. of cases. Psychic causes could not be discovered. (The majority of the cases were from the lower classes.) In thirteen cases

there was a history of traumatism, in nineteen alcoholic excesses. Out of 175 cases with complete histories, 56 per cent. gave a positive history of syphilis, and 25 per cent. a probable history. In seventy-eight cases the period from infection to the symptoms of paresis varied from two to twenty-nine years.

Alimentary Glycosuria in Febrile Disease.

Poll (*Fortschritte der Med*, 1896, No. 13) calls attention to a fact which seems hitherto to have escaped notice, viz., that acute febrile conditions favor the occurrence of alimentary glycosuria. Croupous pneumonia seems especially prone to this, though typhoid fever, angina (tonsillar abscess), articular rheumatism, and scarlatina also furnished examples. In connection with this Poll recalls the fact that in animal experiments the liver during fever contains less glycogen than normal, even if the animals have been fed with carbohydrates, so that an insufficiency of the glycogen-depot has been spoken of. It may be supposed that part of the glucose which finds no place in the liver remains in the blood and is excreted by the kidneys. Whether this explanation holds for the clinical facts must be determined by further experiments, some of which are now making in von Noorden's laboratory.

SURGERY.

UNDER THE CHARGE OF

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The Present Position of the Radical Operations for Chronic Suppurative Otitis.

Jones (*British Medical Journal*, May 30, 1896) makes the following classification of cases of otitis, and gives the appropriate treatment for each:

A. (1) Simple chronic purulent inflammation limited to the main cavity of the tympanum with a perforation in the membrana tensa. (2) The disease limited as in (1), but accompanied by formation of polypi unconnected with bone-disease. (3) In which removal of polypi or granulations from easily accessible parts of the tympanum or meatus reveals small superficial patches of roughened bone.

Cases of group A, except when due to tubercle, are amenable to treatment by the older methods, including curetting, properly carried out.

B. (4) Attic-suppuration, with or without caries of the ossicles.

(5) Cases originally belonging to one of the above four classes, in which adhesions between the ossicles and between the ossicles and tympanic walls interfere with drainage or cause subjective symptoms—extreme deafness, tinnitus, or giddiness.

Several cases of group B might be cited in which recovery took place without radical operation; but in the majority no permanent improvement is gotten until the ossicles are removed by natural or artificial means; in the meantime the patient is subjected to grave risk or to serious discomfort.

C. (6) Chronic suppuration of the mastoid antrum. (7) Cholesteatomata. (8) Caries of mastoid antrum or some part of the tympanic walls which, though inaccessible through the meatus, can be removed by operation without risk to important structures.

No lasting good can be done in cases of this group except by radical operation; the method best adapted to them is the so-called Stacke-Schwartze operation.

D. (9) Caries or necrosis of the petrous bone which cannot be eradicated without destroying important structures or without risk to life. It is in this and group C that tuberculous cases are usually met with.

In group D, seeing that the exfoliation of the diseased bone must to a large extent be allowed to take its own time, it is better to establish a permanent opening in the mastoid.

E. (10) Caries or hyperostosis or exostosis proceeding side by side. Unfortunately the detection of hyperostosis is practically impossible until operation is begun. Owing to the extreme hardness and brittleness of the bone and the sudden change to cancellous or carious bone, these cases can be only safely operated on with the dental burr.

The author believes that, except in tuberculous disease, cholesteatoma, and extensive caries, as much of the natural lining should be preserved as possible, as it tends to prevent dryness and is nearer the normal.

A Case of Hour-glass Contraction of the Stomach Treated by Wölfler's Method.

Lauenstein (*Münch. med. Woch.*, May, 1896) reports a very interesting case of this rare disease operated upon, with relief of all symptoms, by Wölfler's method.

The patient was forty-three years of age, and had been complaining for some years of an obscure disease of the stomach. The symptoms were none of them sufficiently definite to make a diagnosis upon, but the condition became so serious that an operation, exploratory in part, but with the intention of relieving a pyloric stenosis, was determined upon. The incision disclosed the stomach adherent by its lesser curvature to the liver and divided into cardiac and pyloric pouches by an hour-glass contraction. The adhesion to the liver was severed and the two sacs made to communicate by a gastro-anastomosis. The patient made a complete and uncomplicated recovery, all the symptoms subsiding, and the patient regained her normal health and weight.

The most marked differential diagnostic symptom was the vomiting of small

quantities of water when the attempt was made to wash out the stomach, because of the smallness of the cardiac end of the stomach. The occurrence of so small a stomach is of great rarity, except with carcinomatous disease, and, where this is absent, should lead one to consider the chance of hour-glass contraction.

The Operative Treatment of Fracture of the Patella.

In discussing the results obtained in the treatment of this fracture by various methods WHITE (*Annals of Surgery*, 1895, No. 5) gives the following as the results which he has obtained by the use of Barker's method, which he has used in a considerable number of cases:

"I have not invariably succeeded in getting bony union, but have done so in the great majority of cases, and have never had any extensive separation of the fragments. My average results as to shortening the time of treatment and as to the functional usefulness of the joint later have been far superior to any I had obtained before adopting this method. The patients have never had the least after-trouble, and in no case has there been suppuration, or fever, or even marked pain.

"The operation is easy and simple, and can be done in a very few minutes. The lower fragment of the patella is steadied by the finger and thumb, and a narrow-bladed knife thrust into the joint, edge upward, in the middle of the ligamentum patellæ at its attachment to the lower fragment. Through the wound thus made a stout-handled pedicle-needle is thrust into the joint behind the lower fragment, and pushed up behind the upper fragment and through the quadriceps tendon in the middle line as close to the border of the bone as possible, the upper fragment being forced down and steadied. When the point of the needle becomes apparent beneath the skin the latter is drawn upward and incision made upon the needle, the eye of which is then threaded with sterilized silk and the needle withdrawn, carrying the thread behind the fragments. The needle is next unthreaded and passed through the same skin-wound below and out of the upper wound, but this time in front of and close to both fragments. Here it is threaded with the upper end of the suture and withdrawn. The two fragments are then brought together, friction is made to displace clots or other foreign material, and the ligature tied tightly over the lower border of the patella. The two ends of the ligature are cut short and the wound closed. A posterior splint and figure-of-eight bandage are applied. Passive motion may be begun on the tenth day. The patient may get out of bed wearing a light plaster-bandage at the end of the third week. Good use of the joint may be expected in from eight to ten weeks or earlier."

The Action of Sterile Injections of Streptococcic and Saprophytic Toxins upon the Human Organism, especially upon Temperature and Toxic Herpes.

FRIEDRICH (*Langenbeck's Arch.*, Bd. l. Hft. 4; *Berlin. klin. Woch.*, 1895, 49) summarizes his observations as follows:

I. Sterilized virulent cultures of streptococcus longus produce, when injected either subcutaneously or parenchymatously, a fever which begins at the end

of four hours and at the end of twelve hours has reached 104° F.; a similar dose given forty-eight hours later raises the temperature to only 100.3° F. The action of the poison is, *cæteris paribus*, dependent upon the resistance of the particular individual and the grade of his immunization to the particular poison. A culture most virulent for animals produced in man an almost reactionless senility. Filtrates produce similar effects to cultures, only in a less marked degree.

II. A sterilized mixed culture of streptococcus longus and bacillus prodigiosus in a 1 to 300 solution, a dose harmless for mice, guinea-pigs, and rabbits, produced a severe intoxication. On the other hand, the filtrate from the same cultures was very weak in its action, even less as far as the fever went than the pure streptococcus filtrate. It is, therefore, probable that the proteids which accompany the living bacteria are responsible for the injurious action on man.

III. After the injection of the sterilized mixed culture herpes facialis was observed seven times, sometimes extending over large areas, appearing in thirty to fifty-eight hours and after the fever. In five cases there were paræsthesias in the part involved, with pain on pressure in the supraorbital nerve, and in two cases pain after the drying of the vesicles. In the vesicles staphylococcus pyogenes aureus was found three times, and evidence that they have nothing to do with the etiology of the vesicles.

Asepsis in Catheterization.

Grosglik (*Cent. für Chir.*, 1896, No. 1) says that the mechanical methods employed for the sterilization of catheters are entirely inadequate. Complete sterilization can be obtained by the action of hot air at a temperature of 130° C. for one hour, or under steam-pressure for fifteen minutes. Metal catheters may be sterilized in boiling water; but the author cautions against the use of soda in the water, as particles remain attached to the catheter and produce irritation in the urethra.

Strict asepsis should be observed both in the patient and the operator; the meatus and external genitalia should be carefully washed in sublimate solution.

The greatest difficulty, however, is experienced in disinfecting the urethra. The mucous membrane is the seat of numerous forms of bacteria and they are difficult to dislodge. Disinfection is necessary in all acute and chronic infections, in which there is complete or incomplete retention of urine or in which there is hyperæmia or lesion of the vesical mucous membrane.

To procure this sterilization a pint to a pint and a half of sterilized water should be injected gradually into the urethra, care being taken to make the outflow easy so that the water will not enter the bladder. The posterior urethra can be disinfected only in conjunction with the disinfection of the bladder.

Frank (*Cent. für Chir.*, 1896, No. 4) disinfects the different kinds of catheters in formalin-vapor; he hangs them up in a glass cylinder having a sieve-like bottom which fits over a dish containing formalin-pastels. The catheters are completely sterilized after the lapse of twenty-four hours. The use of the catheters disinfected in this manner produces no harmful results.

The Question of Position in the Treatment of Fractures of the Lower End of the Humerus.

Powers briefly reviews the question of the proper position of the elbow in fractures of the lower end of the humerus (*Medical Record*, New York, 1896, vol. xlix. No. 18), and supplements his views with those of Drs. Frank Hartley, B. Farquhar Curtis, and W. W. Van Arsdale. The total number of cases recorded by these gentlemen is 650. Powers concludes as a result of this collective study that "it is our opinion that the best results are obtained by treating the limb in the flexed position, and that the general practitioner will find the greatest degree of satisfaction in following this form of management."

The opinions in detail are:

Hartley and Woodbury (*Roosevelt Hospital*). (*a*) Internal condyle—gypsum-splints from fingers to shoulder, forearm semiprone, elbow at right-angle; (*b*) external condyle—the same as the internal, except that the forearm is supinated; (*c*) transverse or T-shaped gypsum-splint from fingers to shoulder or with shoulder spica, forearm supine, elbow at less than a right-angle.

Curtis (*Chambers Street Hospital* and the *Vanderbilt Clinic*). Plaster-of-Paris bandage from fingers to axilla in most cases; occasionally, when the superficial soft parts are impaired and need watching, a removable dressing with a wooden or tin splint. In the great majority of cases the limb is put up with the elbow inside of a right-angle, but not actually flexed, as the latter position would be less comfortable. The hand is in semipronation. When the "carrying-point" is lost and it is difficult to restore it, owing to the slipping of the fragments, as usually occurs in fractures of the internal condyle, the limb is put up in full extension and supination, with particular attention to the "carrying-point" for about two weeks, by which time the liability to lateral angular deformity has disappeared, and yet union is not so solid as to render it impossible to correct any outer displacement which might interfere with flexion. Then ether is again given, the elbow flexed inside of 90°, and a plaster-splint applied, with careful attention to the position of the fragments. This splint is left in place until consolidation is complete.

Van Arsdale (*Good Samaritan Dispensary*). In all cases flexion to 90° or to 80°; starch or pasteboard dressing until the swelling abates; then the same or plaster-of-Paris for three or four weeks, according to age (until union is complete).

Powers (*Chambers Street* and *New York Hospitals*). "I have put the limb up in plaster-of-Paris at about 90° when first seen, except in those cases in which a tendency to "gunstock" deformity was apparent. In these latter instances I have made the angle 135° for ten days or two weeks, reduction being made under an anæsthetic, with careful attention to the 'carrying-point,' and then changing the angle to 90° or to 80°. I am convinced that the extended position is not necessary to the obtaining of suitable coaptation of the fragments, and I am by no means sure that a moderate degree of cubitus varus is prejudicial to the usefulness of the limb, though I do not know that I am prepared to go quite so far as does Mr. Robert Jones, of Liverpool, who says that neither it nor cubitus valgus is of any consequence from either an æsthetic or a functional aspect."

OPHTHALMOLOGY.

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Œdematous Neuritis of Intracranial Origin.

H. PARINAUD (Paris) thus designates choked disk or papillitis occurring with brain-disease, and argues (*Annals d'Oculistique*, vol. cxiv. No. 1) that optic neuritis of intracranial origin is primarily a lymphatic œdema of the nerve. This œdema is produced by the same influences and the same mechanism as the œdema in the cerebral substance, of which the optic nerve forms a sort of orbital prolongation. It is most frequently combined with hydrocephalus and the increase of intracranial tension which accompanies it, but it does not necessarily imply the existence of ventricular hydropsy. Furthermore, the excess of intracranial tension seems to be incapable alone of producing papillary œdema.

WILLIAM F. NORRIS (*University Medical Magazine*, vol. viii. No. 6), calling it papillitis, says that most investigators are inclined to the view that it is a local inflammation of the intraocular ends of the optic nerves, caused by infiltration of the head of the nerve with infected serum. This fluid passes down between the pial and dural sheaths of the nerves, carrying with it ptomaïnes, bacilli, and tumor-elements, which, owing to neoplastic or to degeneration processes in the intracranial growth and its vicinity, have found their way into the subdural and subarachnoid spaces; and which, accumulating at the distal ends of these lymph-channels, cause an infectious and symptomatic inflammation.

The accumulation of serum, probably infected, in the tissue of the head of the nerve and around it has been demonstrated in many autopsies, but the infectious nature of the infiltration is, he believes, only positively proved in those cases in which tubercle-elements and bacilli have been found in the intraocular end of the nerve.

Treatment of Ophthalmia Neonatorum.

DR. VIGNES (Paris) (*Le Progrès Médical*, 1895, No. 28) agrees in the general verdict as to the superiority of silver nitrate as a local application, and thinks that other measures, often used with it, should be omitted. The insufflation of powdered iodoform, while an excellent modifier of tuberculous suppuration, lacks influence in this affection; and its use after the application of silver nitrate may cause the production of silver iodide, which is extremely caustic. As a cleansing-solution he prefers potassium permanganate in the

strength of 1 to 4000. It seems to have a specific action on the affected membrane, markedly superior to that of boric-acid solutions. Solutions of carbolic acid exert a very deleterious effect upon the cornea. The cleansing-solution should, in any case, be used as hot as it can be borne.

Temporary Amblyopia from Chocolate.

Casey A. Wood (Chicago) reports (*Medical Record*, vol. xlviii. No. 24) the case of a physician, aged fifty-four years, of gouty habit, for which he had exercised great care in his diet, especially as to alcoholic drinks. He suffered from severe headaches, closely resembling migraine, beginning with a rotating mass, devoid of color in front of both eyes, which gradually increased in size and density until the whole field of vision was covered, and he became practically blind. For ten minutes even the largest objects could not be perceived. There was merely ability to count fingers at a few inches. Then the outline of large objects began to loom up, and in a half-hour smaller objects were visible; in three-quarters of an hour to an hour the vision was as good as ever. This was always accompanied by vertigo, intense nausea, severe pain and sense of pressure in the head. He had been variously treated for eye-strain and general ailments, and the attacks were attributed to many causes. Some ten years before he had found that by refraining from sweetmeats he could lessen the number of attacks. At last his suspicion was attracted to chocolate, and subsequent observation, extending over a year, proved that it was always chocolate that induced the attacks. He had since found that he could eat sweetmeats not flavored with chocolate with impunity. He could also drink coffee or cocoa, but chocolate in any form promptly provoked a seizure.

Acute Contagious Conjunctivitis.

The occurrence of acute conjunctivitis, apparently by contagion, has long been noted, and some ten years ago J. E. Weeks described, in connection with such cases, a special form of bacillus which has since been recognized by others. Victor Morax and G. W. Beach (Paris) have recently made an extended bacteriological and experimental study of the subject (*Archives of Ophthalmology*, vol. xxv. No. 1). They give the disease the title of Acute Contagious Conjunctivitis, and find it characterized by the presence of the special micro-organism which has received the name of Weeks's bacillus.

It is always contagious—frequently epidemic. The symptoms, which vary in severity, begin two or three days after infection, with gluing together of the eyelids on awaking in the morning, and small, yellowish masses at the base of the lashes. There is increased lacrymation, congestion, and turbid discharge. It usually begins first in one eye, but affects both in its course. There are burning pain and the sense of a foreign body; the lids are swollen and discolored; and the eyeball is of a rosy tint, which has given the affection the name of "pink-eye." The symptoms continue to increase for two or three days, and frequently a slight coryza arises.

The disease runs an acute course, recovery being usually complete in two or three weeks, although some cases continue several weeks or even months.

It is more severe in adults than in children. In severe cases there may be marked purulent discharge and slight chemosis, and the cornea may become involved. The prognosis is, however, quite favorable. It should be treated by applications of nitrate of silver of the strength of 1 to 40 or 1 to 50, weaker solutions being less effective. The bacillus is found by a microscopical examination of the discharge, with a one-twelfth immersion objective. The cultures of it are best obtained on five-tenths per cent. agar, the tubes being corked to prevent evaporation from the surface, or in a mixture of human serum with peptonized agar. The bacilli are devoid of movement. Inoculation on animals of different species gave results constantly negative. Inoculation of a culture on the human conjunctiva produced a typical attack.

Use of Sutures after Cataract-extraction.

C. H. Williams (Boston) has used a suture in the conjunctival flap, and reports (*Boston Medical and Surgical Journal*, 1896, No. 16) eleven cases with favorable results. He makes his incision in the periphery of the cornea, inclining the edge of the knife slightly backward and cutting out with very gentle pressure, leaving a small flap of conjunctiva attached to the cornea. After the extraction of the lens this flap is united to the ocular conjunctiva by from one to three sutures of fine sterilized black silk. This secures the advantage of a conjunctival flap without any risk of its becoming rolled up or included in the wound; and lessens the danger of subsequent hernia of the iris or vitreous prolapse.

The Correcting-glass for Presbyopia.

E. Landolt (Paris) calls attention (*Archives d'Ophthalmologie*) to the defect in the rule often given for the choice of glasses, for near work, in presbyopia. This rule is to give the glasses which will bring the patient's near-point to a certain fixed distance, commonly 22 cm. or nine inches. Where considerable power of accommodation remains the glass that does this may not be sufficient. After the power of accommodation is almost or entirely lost the working-point is brought up to the focal distance of the glass, which is quite too near for persons that have good visual acuity. The better way is to base the presbyopic correction upon the distance from the eye at which the work is to be done, making the strength of the glass such that at this distance not more than two-thirds of the accommodation will be called into play.

Light-perception in Diagnosis.

R. W. Henry (Leicester) from a careful study of the light-perceptive power in 203 eyes, finds that it is not a constant quantity, but begins to diminish after the age of thirty years, and most markedly after sixty years. He says (*Ophthalmic Review*, vol. xv. No. 172) that eyes with hyperopia of over 4 D. have diminished perceptive power. In disease it is most diminished where the retina is most affected, either by pressure or a poisoned condition of the blood.

In cases of amblyopia with normal fundus (or at most with slight pallor of

temporal side of disk) and central color-scotoma, if the light-perceptive power be normal, the case is probably one of toxic amblyopia; if the visual field be full, nicotine is the determining cause; if spirally contracted (a "retinal exhaustion" field), alcohol is the predominating factor. In both cases the prognosis is good as to ultimate recovery; in the former it may, and probably will, take months; in the latter, weeks.

A New Method of Treating Pterygium.

Anton Coe (Washington) has found that by destroying the apex of the pterygium the growth undergoes rapid atrophy. He reports (*Annals of Ophthalmology*, vol. v. No. 2) two cases, one of thick and one of thin pterygium, in which, under cocaine, the apex of the growth was touched with a platinum-probe heated to redness. After this cauterization the vessels supplying the growths disappeared in a very few days. The vessels themselves were not touched in either case, the action of the cautery being confined to the apex of the growth. He thinks this an ideal operation for pterygium.

Episcleritis Periodica Fugax in Young Persons.

Sidney Stephenson (London) calls attention to the fact that this condition, recently described by Fuchs (see page 107, January number), occurs not infrequently in children. He reports (*Medical Press and Circular*, March 18, 1896) two cases occurring in girls of from nine to fourteen years of age. These cases had—the first, seven attacks in eighteen months; the second, eight attacks in five and one-half years; the third, eleven attacks in less than three years; the fourth, five attacks in two years; the fifth, eight attacks in less than one year; and the sixth, two attacks six months apart. The last patient was still under observation; others had been lost sight of, perhaps still subject to such attacks.

Choroidal Hemorrhage following Cataract-extraction.

J. A. Spalding (Portland, Me.) reports a case (*Archives of Ophthalmology*, vol. xv. No. 1) of this kind, and gives a very full bibliography of previously reported cases. The accident is by no means so rare as has been thought. Over fifty cases have been reported, and probably many remain unpublished, in the dread of publishing an accident which may seem to be due to a badly performed operation; but the names of the surgeons to whom the accident has occurred show that it is due solely to the diathesis of the patient. The chief cause is, undoubtedly, the atheromatous condition of the vessels, or an abnormal tension of the eyeball, suddenly reduced by the incision of the cornea and the outflow of aqueous. When it occurs the best treatment is to raise the patient's head, to relieve the pain, and to watch the eye carefully, prepared to perform enucleation as soon as possible. It does not occur more frequently with iridectomy than after simple extraction.

DERMATOLOGY.

UNDER THE CHARGE OF

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The Etiology and Histology of Parasitic Sycosis.

Ullman has recently published the results of a clinical, bacteriological, and histological study of eight cases of this affection (*Wiener klinische Wochenschrift*, 1896, Nos. 18, 19, and 20). As the result of his investigation he agrees with Sabouraud as to the existence of an ectotrichal form of trichophytosis in which the elements of the fungus remain in the hair-sheath without entering the substance of the hair. In all the cases except one the form of fungus was that described by Sabouraud as *tricophyton mégalosporon pyogène du cheval à culture blanche;* in two of the cases other micro-organisms were present (staphylococci). Differences in the extent and intensity of the affection are to be explained by different degrees of virulence of the organism; by varying sensitiveness of the skin, according to age, race, locality; the chemical reaction of the sweat; cleanliness; neglect of the skin. In one of the cases studied small vesicles filled with serum and pus were present, together with large patches deprived of epithelium and covered with pus and crusts, so that the case was regarded as an impetigo contagiosa until the microscope revealed the presence of fungus. The author believes there are two kinds of impetigo which clinically resemble one another, the one due to the trichophyton, the other to staphylococci.

The histological changes which accompany the process begin with the entrance of the fungus into the hair-follicle. Inflammatory changes occur in the parts around the follicle, evidently through the action of toxins formed by the fungus. There arises first a cellular infiltration in the tissues around the follicle, a perifolliculitis, which in the beginning consists chiefly of mononuclear leucocytes; later, increasing numbers of polynuclear leucocytes appear, which penetrate the internal and external root-sheaths. In this way the cavity of the follicle becomes enlarged and its walls thinned and finally destroyed. The suppuration of the hair-follicle leads not only to falling out of the hair, but to destruction of the sebaceous glands belonging to the follicle. A remarkable feature of the whole process is the remote effects of the presence of the trichophyton in the follicle, which can only be explained by the supposition that the fungus forms a toxin which produces inflammation in the follicular tissues. Another remarkable feature is the presence of giant-cells. All the cases were due to the same fungus, and the author believes this fungus capable of exciting suppuration without the intervention of other micro-organisms.

Acute Pemphigus.

In a paper based upon the study of seventeen cases PERNET and BULLOCH present the following conclusions (*British Journal of Dermatology*, May and June, 1896):

1. There is a group of rare cases of acute bullous eruption, accompanied by severe constitutional symptoms, and generally terminating fatally, which affects butchers.
2. The disease follows a wound of the hands or fingers.
3. It is probably due to a micro-organism.
4. The same etiological factors are probably at work in another group of very similar cases, in which the patients are brought into contact with animals or dead portions of animals.

The Anatomical Characters of Duhring's Disease (Dermatitis Herpetiformis).

At the séance of June 11, 1896, of the Société Francaise de Dermatologie et de Syphiligraphie (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6), LEREDDE made a further communication concerning his researches upon the alterations of the blood and of the skin in dermatitis herpetiformis. In the examination of the blood and the contents of the vesicles and bullæ the following technique is employed: A drop of blood is placed upon the slide and spread out into a thin layer by drawing another slide over it. After it has dried it is fixed in alcoholic ether and dried again. It is stained by Meyer's hæmatin for five minutes, washed, and then passed rapidly through the following solution: eosin, 1; alcohol, 100; orange, 1; water, 100; mix.

Leredde maintains that, while eosinophilia may be found in other diseases, it is not associated in these with the excretion of eosinophilous cells by the skin; it is the union of these two which is characteristic of Duhring's disease.

Chrysarobin and Chrysophanic Acid.

In a paper read before the Dermatological Society of Great Britain and Ireland (*British Journal of Dermatology*, July, 1896) DR. WALTER G. SMITH considered the chemistry and therapeutic properties of these two substances. Chrysophanic acid does not stain like chrysarobin, and is scarcely at all irritating; but the comparative experiments made with the two substances in the treatment of psoriasis lead to the conclusion that the former is not an efficient substitute for the latter in the treatment of this disease.

Some Arsenical Preparations and their Employment in Dermatology.

DANLOS, seeking to replace the ordinary pharmaceutical preparations of arsenic with others less irritating and poisonous, has experimented with the metalloid arsenic, with the sulphuret, and with cacodylic acid (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6). The first of these was administered suspended in honey, in a daily dose of 15 to 30 centigrammes. Given in psoriasis it produced very manifest improvement and finally

disappearance of the eruption without any untoward effects. The sulphuret was likewise successfully employed in the treatment of psoriasis. Cacodylic acid was experimented with because it is said to be non-toxic, and, on account of its solubility, readily absorbable. It was administered in daily doses of 25 centigrammes, and was perfectly tolerated, while it produced the usual therapeutic effects of arsenic.

The Origin of Pelade.

In the fourth memoir Brocq presents the following conclusions (*Annales de Dermatologie et de Syphiligraphie*, 1896, No. 6):

The initial stage alone of ordinary benign alopecia areata is microbic. As soon as the peladic patch becomes smooth, microbes can no longer be found, neither in the skin nor in the follicle. In the beginning of the disease almost all the follicles are infected with innumerable microbian colonies belonging to a single bacillary species always the same.

In benign cases the follicular infection is transitory; in chronic or total alopecias the same microbe is found constantly, with the same localizations.

The invariable presence of this microbe wherever there is a beginning peladic lesion gives it a value other than that of an ordinary secondary infection. However, this micro-bacillus, notwithstanding certain differences of form, cannot be distinguished with absolute certainty from the microbe which Hodara has described as the bacillus of acne. If the bacillus of Hodara and that of alopecia areata are the same, it remains to learn why in every case of alopecia this secondary infection is constant, and what role it plays. If they are different, they must be differentiated experimentally. Finally, they may be the same bacillus which, under different vital conditions, may or may not secrete a toxin capable of producing alopecia.

OBSTETRICS.

UNDER THE CHARGE OF

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Retained Placenta through Contraction of the Internal Os.

Gottschalk (*Berliner klinische Wochenschrift*, 1896, No. 21) reports two cases of this complication of labor, as follows: Each patient had borne a full-term child, labor being characterized by vigorous pains. No considerable bleeding followed the expulsion of the child. On examination the internal os was found so tightly closed that a finger could not enter. Under chloroform-narcosis the fingers were introduced and a small, thin placenta

found high up in the uterus and firmly attached to the uterine wall. There was no especial difficulty in removing the placenta, and the patients made an uninterrupted recovery.

On studying the causes for the placental retention Gottschalk considers the abnormally small, thin placentæ (seven months' placentæ), the situation of the placentæ (high on the posterior uterine wall), and the prompt, firm contraction of the uterus as the best explanation for the complication. The children were full term and well nourished.

Infantile Syphilis.

Coutts (*British Medical Journal*, 1896, No. 1843) gives the results of his studies on this subject, summarized from the Hunterian lecture:

Regarding parental influence in infection, he finds a syphilitic mother much more potent in infecting than a syphilitic father. As far as prognosis in treatment goes, it makes no difference whether the father or mother is the infecting agent. In syphilis by conception the mother's entire or partial immunity is caused by the production of antitoxins in her body which increase with successive pregnancies.

Marasmus and congenital atrophy of the secretive and absorptive surface of the intestinal tract are considered among the most important symptoms of inherited syphilis. While first symptoms commonly appear in the second month, they may be delayed twelve months. Visceral disease (enlargement of spleen and liver) was found in most cases. Bone-lesions were less often observed; pain was often absent in syphilitic epiphysitis; suppuration was rare, usually seen in the long bones in children old enough to walk. Acquired syphilis is always accompanied by a chancre, followed by roseola and often sore-throat.

Coutts calls attention to two propositions embraced in Colles' law—one that the mother of an infant with inherited syphilis cannot acquire it from the infant; the other, that such an infant would infect a healthy wetnurse. Coutts has found inherited syphilis very feebly contagious, while acquired syphilis is actively so. In practice the only limitations he would place on nursing would be that the mother or wetnurse should have no excoriations on the nipples and that no ulcerations or fissures be present on the mouth of the infected infant.

Cæsarean Section.

In the *Medical Chronicle*, 1896, vol. 5, No. 4, Sinclair reports the case of an unmarried woman who had hip-joint disease, was greatly deformed, had lost an eye, and had very defective teeth. She was in labor, the membranes unbroken. She was delivered by cœlio-hysterotomy, without turning out the uterus. The womb was sutured and a drainage-tube placed at the lower angle of the abdominal wound. The patient made a gradual recovery. No evidence of syphilis was present.

In discussing the case Sinclair states that the uterus was not removed because the conservative operation is safest and best. He considers it unnecessary to assign his grounds in reporting this or any individual case.

[The method of treatment employed in this case is open to discussion, although the operator may decline to consider any but his own methods worthy of consideration. In view of the patient's physical and social condition and the success of cœlio-hysterectomy with intrapelvic treatment of the stump, it is not easy to appreciate the wisdom of what is called a conservative procedure, which preserves the patient's reproductive powers to expose her to another abdominal delivery. The employment of the drainage-tube in an aseptic abdomen, with aseptic surgery, is not the best usage at present. The treatment employed seems to have been conservative only in its adherence to methods belonging to a period long since passed in the development of obstetric surgery.—EDITOR.]

THE EXAMINATION OF THE ABDOMEN DURING THE PUERPERIUM.

In the *British Medical Journal*, 1896, No. 1856, MCCANN gives his results in the study of involution. His method consisted in measuring with a tape-line from the middle of the fundus uteri to the pubes, taking this at the same hour and with bladder and rectum of the patient empty. Septic cases were excluded. In 37 primiparæ the uterus was found in the true pelvis in 29 before the thirteenth day. In 21 multiparæ the womb had entered the pelvis in 13 before the thirteenth day.

Conditions which favored prompt involution were full-term labor, involution being delayed after premature labor; normal or excessive length of labor; and the parity of the patient, as after repeated labor involution is slower. Contrary to what is commonly held, McCann could not find that lactation furthered involution, but rather predisposed to anæmia, which delayed it in many cases. Women who had no secretion of milk whatever often had the most complete involution. Prolonged lactation produced super-involution, a distinctly pathological condition. He also observed that involution proceeds most rapidly during the first week of the puerperium. After-pains, in these cases, had no effect on involution, but are abnormalities in involution, caused either by retained clots or placental remains or without known cause, resembling dysmenorrhœa.

OVARIAN PREGNANCY, REMOVED INTACT.

In the *Lancet*, 1896, No. 3804, OLIVER reports an interesting case of advanced ectopic pregnancy. An effort was made to obtain a skiagraph by exposing the tumor to the Roentgen rays for thirty minutes, but without success. On opening the abdomen the tumor was found to have a distinct pedicle, which was ligated and the entire mass removed. It proved to be the right ovary, which had become a closed sac containing fœtus and appendages. After adhesions to the intestine had been separated its removal entire was a simple matter. The patient made a good recovery.

SYMPHYSIOTOMY FOLLOWED BY PUBIC FISTULA.

In the *Monatsschrift für Geburtshülfe und Gynäkologie*, 1896, Band iii. Heft 4, HEINRICIUS reports a symphysiotomy in a woman whose first labor ended by craniotomy. The second was terminated by symphysiotomy, which was

uncomplicated. The patient's recovery was retarded, however, by a fistula which led to the symphysis, and opened near the mons veneris. This resisted treatment, and was accompanied by necrosis of the severed bones. Complete recovery finally occurred, with firm union at the pubis.

Injuries and Operations on the Genital Organs during Pregnancy.

Villa (*Annali di Ostetricia e Ginecologia*, 1896, No. 4) reports two interesting cases of tear and chronic inflammation of the cervix uteri in pregnant patients. One was treated by amputation of the cervix, with a good result in curing the local disease and without interrupting pregnancy. In the other reflex disturbances were so severe that abortion occurred, although the local treatment was limited to glycerin-tampons and lotions. He reports, also, a case of simple suture of a torn cervix during pregnancy, without abortion.

Epithelioma of the Pregnant Uterus.

In the *Medical Chronicle*, May, 1896, Sinclair describes a very interesting case of epithelioma of the cervix in a pregnant patient, which was not diagnosticated in the early stages, although the patient was in the hospital. When first examined by Sinclair the ulceration was so shallow that it was hoped that the disease could be entirely removed, and operation was urged. As a first step the uterus was emptied, after which the patient felt so much improved that she refused further treatment. When she finally returned ulceration had become extensive and the tissues about the uterus were involved. After vaginal hysterectomy the patient remained for some time in excellent health, but finally died of a return of the disease. The case was a remarkably favorable one for cure, had early diagnosis and treatment been possible.

One Hundred and Five Labors in Patients with Contracted Pelves.

In the *Archiv für Gynäkologie*, Band 51, Heft 3, Knapp gives the results in 105 labors in patients with contracted pelves. These labors occurred in the Prague Clinic, in a sum total of 4289 labors during four years.

Pelvic contraction is not so frequent in Bohemia as in some other countries; flat and justo-minor pelves are most common; rhachitis was present in more than half the cases. But 8 cases of osteomalacia were seen in the 105. The skeletons of primiparæ with contracted pelvis were less heavily developed than in other cases.

During these labors uterine contractions were, as a rule, good. Premature rupture of the membranes was much more common than in normal cases.

As regards treatment, induced labor gave no mortality for mother or child, with a morbidity-rate of 50 per cent. for mothers.

The use of forceps resulted in mortality of *nil* for mothers, and 17.7 per cent. for children. The morbidity-rate for forceps was 5.8 per cent. for mothers and 17.6 per cent. for children. Version gave no mortality and morbidity for mothers and 23 per cent. mortality and morbidity for children. Embryotomy

was followed by no maternal morbidity or mortality. Cæsarean section resulted in 10 per cent. mortality for mothers and 30 per cent. for children. The mothers had also a morbidity of 10 per cent.

Symphysiotomy (one case) was followed by good result. The entire series of cases resulted in a maternal mortality of 95 per cent., with morbidity of 3.81 per cent. For the children the mortality was 31.43 per cent., with a morbidity of 13.33 per cent.

In general, operative treatment was followed by a low maternal mortality, and a comparatively high fœtal death-rate. As regards morbidity operative treatment was far more successful with the mother than expectant treatment, while for the child the reverse was true. The low maternal and high fœtal mortality of the 105 cases was obtained by following the rule to regard the mother's interests as paramount over the child's. [It is not difficult to understand such a result when the mother's interests are alone considered. It is quite possible, however, that operative treatment (symphysiotomy especially) in some of these cases might have lessened fœtal mortality without increasing maternal risk.—ED.]

PÆDIATRICS.

UNDER THE CHARGE OF

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THE DIPHTHEROID STOMATITIS OF INFANTS.

BECO (*Archives de Mèdecine expèrimentale et d'Anatomie pathologique*, July, 1896, p. 433) describes under this name a disease which, though unrecognized, has been often confused, especially by the Germans, with aphthous stomatitis. Seven cases were observed during the course of an attack of scarlatina. In five of these cases the staphylococcus pyogenes aureus was found in pure culture in the membrane, in one the streptococcus pyogenes, and in the last the same organism with some colonies of the staphylococcus albus. In four of the five cases having the staphylococcus aureus impetiginous lesions were present on the face. Six other cases from an outpatient service were observed, only one of which showed the golden staphylococcus. Of the others, two exhibited the streptococcus pyogenes with the staphylococcus albus, and three presented the same organisms together with the micrococcus tetragenus.

From a study of these cases the author describes diphtheroid stomatitis as a discrete localized affection of the buccal mucous membrane. Its seat of preference is upon the middle of the lower lip, upon the dorsum and borders of the tongue, more rarely upon the gums. He has never seen it upon the inner aspect of the jaws or upon the soft palate. These points of election are precisely

those which are most directly in contact with objects which are carried to the mouth. The lesion presents itself as a plaque rising above the surface of the mucosa. These plaques vary in size from that of the head of a pin to that of a centime-piece, yellowish to grayish-white in color, the surface sometimes smooth, sometimes reticulated. In shape they are usually oval, though sometimes circular or polycyclic when two or more have coalesced. They are adherent to the subjacent tissue, and can be detached with a little force, leaving a grayish or reddish surface, irregular and bleeding slightly. The affection is scarcely painful, is accompanied by slight glandular enlargement, sometimes by exaggerated salivation, and rarely by fetor of the breath. These plaques appear without preceding vesicles, as in aphthæ; once formed they do not increase in size, unless several neighboring plaques coalesce. In the natural process of healing the exudate disappears, leaving a healthy ulceration which heals, forming a slightly depressed cicatrix. The natural termination is in cure at the end of from eight to fifteen days, which may be hastened by cauterization with the silver-stick. The affection is, therefore, parasitic and may be caused by several microbes, especially the staphylococcus pyogenes aureus and the streptococcus pyogenes. When once these organisms have produced diphtheroid plaques the affection is capable of being transmitted by contagion.

Night-terrors Treated by Music.

Bestchinsky (*Vratch*, 1896, No. 2, p. 49) has tried the effect of instrumental music in calming the night-terrors of a child three years old. The child awoke every night in a terror that could not be allayed by any of the ordinary means. The author advised that a piece of music be played in his hearing, choosing one of Chopin's compositions (Valse Brillante, No. 2). From the first evening the child slept without awaking. After some days the treatment was interrupted and night-terror recurred. It was prevented by resuming the treatment for a time. The cure was definitive after several months. Equally satisfactory results were achieved by this treatment in the hands of Dr. Berberoff, a friend of the author's.

The Parasites of Pertussis.

Kourlow (*Vratch*, 1896, No. 3) ascribes whooping-cough to a ciliated amœba already described by Deichler in 1886. It is best detected, he says, in the mucus of the early stage, before the discharge becomes purulent. The organisms are unicellular, varying in size from half that of the red blood-corpuscle to that of the white corpuscle, or even larger. One side or two opposite sides are covered with long ciliæ which are in constant motion, and give to the bodies a rapid oscillatory movement. These movements cease when the liquid under examination becomes cold, but they may be observed for a long time upon the warmed stage. These corpuscles are clearly visible even when immovable. They may be stained with Ziehl's carbol-fuchsin. In dry preparations the bodies are small, but their ciliæ remain clearly visible. At a later period, in the purulent expectoration, these bodies are much fewer and very difficult to find; but there are now present in great number small, round, highly

refracting bodies, concentrically striated like starch-granules. These are of variable size, the largest attaining a diameter double or triple that of the red corpuscle. In the larger ones can be seen a strong double envelope containing protoplasm with a central ovoid nucleus and brilliant nucleolus. The smaller bodies have only a thin ring of protoplasm, so that the envelope, protoplasm, nucleus, and nucleolus give the appearance of concentric rings; they are either isolated, grouped, or heaped up in large granular cells.

A Case of Scarlatina with High Temperature.

Depasse (*Revue mensuelle des Maladies de l'Enfance*, June, 1896, p. 294) records a case of scarlatina in an infant of sixteen months, which on the twelfth day was attended by a temperature of 107.5° F. Despite the use of antipyrin and cold baths repeated every two hours, this degree of elevation was maintained for seventy hours, after which the temperature slowly declined and the child made a good recovery.

The Rôle of the Streptococcus in Scarlatina.

Lemoine (*Société médicale des Hôpitaux*, March 20, 1896) has examined the blood in 35 cases of scarlatina, 33 of which followed the usual type and 2 assumed a hemorrhagic form, one of these being fatal at the end of forty-eight hours, the other after five days. Cultures of the blood of the 33 benign cases taken at the beginning of the eruption gave no growth, and the same negative result followed cultures made during the course and after the disappearance of the eruption. In the two hemorrhagic cases alone a pure culture of streptococci was obtained, and these two patients presented large sanguineous effusions from the margins of which the blood to be examined was taken. These streptococci, as in the researches of d'Espine and Marignac, coagulated milk and produced visible cultures upon potato. The streptococcus, therefore, seems to be accidental and due to complications of the disease. In this light the hemorrhagic form of scarlatina, it appears, should be considered as the result of the passage of the streptococcus into the blood and as the expression of a secondary infection of the entire organism.

Among the complications two cases of pleurisy, one fibrinous, the other purulent, gave the same streptococcus in pure culture; one of two cases of arthritis of the knee gave the streptococcus, the other a negative result. In twenty-two cases of nephritis with albuminuria this streptococcus was found in the urine of all, the angina having been of grave character. In eleven cases in which the urine remained normal the streptococcus was found in but one.

The author's conclusions are, therefore, that in scarlatina the renal complications are secondary and are the result of a streptococcic infection; that this secondary infection of the kidney is most often the result of a special virulence of the streptococcus developed in the fauces; and, finally, that these complications may become the point of departure of accidents of the same nature capable of being propagated by contagion.

In this connection reference may be made to a bacteriological study of Kemper (*St. Petersburg Thesis*, 1895, and *Vratch*, 1895, No. 42) who has

examined 205 cases of scarlatina without finding a streptococcus in the blood except in cases assuming a pyæmic form.

Cyclic Albuminuria in a Family.

While examining the urine of a chlorotic girl of fifteen years, Schön (*Jahrbuch f. Kinderheilkunde*, 1896, Bd. xli. S. 307) found an albuminuria which subsequent examinations showed to be of the cyclic type: Albumin appeared about 11 A.M., and reached a maximum about 3 o'clock in the afternoon, diminishing thereafter until it disappeared completely by 8 o'clock P.M., and remaining absent during the night. Recalling an observation of Heubner's, who found cyclic albuminuria in several members of the same family, the author examined the urine of two sisters and two brothers of the patient and found the same condition in one of the sisters, a girl of thirteen years, also chlorotic. Treatment of the chlorosis had no effect upon the albuminuria. Unfortunately the two patients soon passed from observation. The author asks if the cyclic albuminuria had any dependence upon the chlorosis. In this disease, as is well known, there is sometimes fatty degeneration of organs and bloodvessels which explains the occurrence of œdema in certain cases by transudation through the walls of the vessels. The appearance of albumin in the urine in cases of cyclic albuminuria may, according to the author, be produced by a mechanism similar to that causing œdema.

Otitis in Measles.

Bezold (*Münchener medicinische Wochenschrift*, 1896, Nos. 10 and 11) has repeated the studies of Tobeitz upon the frequency of otitis in measles, and concludes with him that otitis is a constant accompaniment of this disease. This conclusion is based upon explorations of the ear in a large number of cases and upon post-mortem examinations of sixteen fatal cases.

In these sixteen cases microscopic examination of the middle ear showed the existence of otitis media. Except in one case where the exudate was found in the osseous portion of the Eustachian tube, an effusion, muco-purulent, sero-purulent, or completely purulent, was found in all the cases, not only in the drum cavity, but also in the antrum and in the mastoid cells, where the latter were sufficiently developed. The mucosa of all these parts was swollen, congested, and covered with a fine network of vessels or with minute hemorrhages. Bacteriological examination of the exudate showed in half the cases streptococci, in the other half either white or golden staphylococci. The same organisms with the same frequency were found in the exudate obtained by puncture of the tympanum in cases that recovered.

This otitis appears early in the course of the disease, perhaps at the same time as the eruption and is in full development on the third or fourth day thereafter. Clinically its evolution is benign, generally without marked symptoms; perforation is exceptional, and, when produced, is followed by prompt cicatrization. Most often it requires no intervention and leaves no trace of its course, as the author has proved by comparative examinations among school-children.

The author rejects the theory of infection from the naso-pharynx, but

concludes from the constancy of the lesion that it is simply a localization of the virus upon the mucous membrane of the ear, similar to that upon the conjunctiva, bronchi, and intestinal mucosa. In other words, this otitis is a sort of enanthem analogous to the exanthem of the skin.

A Second Attack of Measles.

Gottstein (*Münchener medicinische Wochenschrift*, 1896, No. 13, p. 288) reports a case which permits of some interesting deductions concerning immunity. A girl of ten years had an attack of measles which was marked by abundant eruption, but showed very slight symptoms in the respiratory and conjunctival mucous membranes. Two years later she had the disease anew, which now presented a totally different aspect. The prodromal symptoms (fever, angina, bronchitis, conjunctivitis, and coryza) were extremely violent, and the eruption was delayed and little marked.

The author believes that the case supports the theory of acquired immunity formulated by Schleich. In the first attack the virus seemed to act especially upon the skin and but slightly upon the mucous membranes; the skin had thus become immunized. So in the second attack the poison affected especially the mucous membranes, having but little effect upon the skin previously immunized.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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The Pathology of Fever as bearing upon Antipyretic Medication.

Few questions in connection with the infectious diseases are of greater interest to the practitioner of medicine at the present time than the significance of the fever which so constantly forms one of their most characteristic symptoms. For centuries the accepted treatment of these diseases has been directed to "breaking" the fever, resting upon the belief that this symptom is distinctly injurious, that the major part of the danger to the patient arises from it, and that it must at all hazards be overcome. With the development of our knowledge of the bacteria and of their causative relationship to disease, more particularly as regards the manner of their action upon the body, the question has arisen whether in reality the febrile condition is prejudicial to the natural progress of these diseases toward recovery; whether, in fact, it may not be a necessary part of the reaction of the body-tissues to the poisons of the diseases, and in so far conservative. If so, its treatment by means of antipyretics may do harm rather than good, interfering with the natural progress of the disease.

For this reason the discussion of "Fever and the Value of Antipyretic Medication," which occupied a prominent place in the proceedings of the Fourteenth Congress of Internal Medicine at Wiesbaden in April last, is of unusual interest (*Cf. Centralblatt f. allg. Pathologie u. f. path. Anatomie*, vii. 1896, Nos. 8 and 9, 377). We can here touch upon only those points in the discussion having direct pathological bearing.

In introducing the subject of the value of antipyretics KAST propounded the question: "In the present state of our knowledge, what is the effect of increased temperature upon the healthy body and upon the infected organism?" In the attempt to answer this question experiments of Walther, Löwy and Richter, and Filehne are referred to, which show that animals suffering from various infectious processes do better and survive longer when kept at temperatures above the ordinary room-temperature. In Filehne's experiments animals which had been inoculated with the erysipelas coccus did worse when subjected to cold for the purpose of lowering their temperature, even though they were afterward restored to the room-temperature, than other animals similarly inoculated, which were kept continuously at the room-temperature.

Again, Müller has shown that the viability of the typhoid bacillus, as evinced by its power of multiplication, is less at fever-temperatures than at the normal body-heat; is, in fact, about 15 per cent. less. Without attaching much weight to these results of Müller as indicating an actual inhibiting effect of fever upon the growth of micro-organisms in the body, Kast nevertheless considers them important as showing that elevation of temperature incident to typhoid fever has no influence to increase the growth of the typhoid bacillus.

It is also clear that fever can have no influence upon the specific alexins, the natural immunizing agents of the body, since these substances must have been overcome before the infectious material can have obtained a hold upon the body, and consequently before the onset of fever; but the question as to the effect of fever upon the action of the specific antitoxins is different. They are elaborated by the body-cells during the progress of the disease. Upon this subject experiments by Kast and Kühnau throw some light. In these experiments animals inoculated with typhoid bacilli received afterward injections of a strong antitoxic serum and were subjected to various degrees of heat, some to the ordinary room-temperature, others to temperatures up to 41° C., with the result that the animals kept at the lower temperature died, while several of those exposed to the fever-temperature survived. Kast concludes that while the effect of the fever in these cases cannot be set down with certainty as beneficial, it is much more probable that it assists the beneficent action of the antitoxin than that it impairs it. Whether the elaboration of the specific antitoxins by the body is assisted or impeded by the fever-temperature is unknown, but it has been shown that neither leucocytosis nor phagocytosis is lessened by it.

The increased elimination of nitrogen and the decreased alkalinity of the blood observed in febrile disorders are believed by Kast to be too slight to warrant serious consideration as evidence of a deleterious effect of fever, more particularly as they are not infrequently observed in non-febrile conditions. They would appear to be in a large measure accidental concomitants

of fever and quite insignificant in any discussion of its effect upon the organism as a whole.

The same may be said of the fatty degenerations of parenchymatous organs, to the frequent occurrence of which in febrile disorders Ziegler has drawn attention. They are too inconstant and too slight in intensity to be regarded as of much moment.

The inevitable conclusion, then, is that so far as our knowledge at present indicates, the danger connected with an acute infectious disease is never, or, at all events, but rarely dependent upon the fever which accompanies it. Increased metabolism and febrile dyspepsia are to be regarded as the only significant deleterious effects of the febrile state, and their influence is at best but slight. It is admitted that long-continued fever may have an unfortunate effect upon the nervous system of a susceptible patient, just how is not known, and Kast believes this to be the only clear indication for antipyretic treatment, which in such cases is best accomplished by cool baths and by the occasional use of quinine.

At the second session of the Congress UNVERRICHT took up the same subject from a somewhat different point of view, presenting our most recent conception of the condition which we designate "fever" as a whole.

Liebermeister's theory is rejected that fever is a complexus of symptoms induced wholly by the elevation of temperature and resulting from the effort of the organism to adjust itself in all its processes to the increased heat. This theory is found upon analysis to be inadequate to explain all the phenomena of fever, for, indeed, a majority of the symptoms of fever are certainly not the result of the elevated temperature, but have with them a common cause in the various toxins of the infectious principles and in their effect upon the various tissues of the body. This conception of fever is furthermore untenable for the reason that it is impossible to conceive of all the concomitants of fever as the result of any single mechanism or condition which could result from a mere increase in the body-heat. Even the elevated temperature itself may be the result of increased heat-production, of diminished heat-elimination, or of disturbance of the heat-regulating mechanism—of one or all of these factors combined.

The competing theory, that fever is a definite complexus of symptoms among which elevation of temperature is constant, is also unsatisfactory, since the clinical picture of fever is by no means constant. Many of its factors are entirely absent at times, or may play but an insignificant part in it, and this is notably the case with regard to its cardinal symptom, elevation of temperature. Furthermore, the absence of any single cause of the febrile condition in all cases points here also against the idea of an intimate relationship between the various symptoms usually classed together as evidences of fever, Centanni's theory of a single fever-producing toxin common to all the infectious diseases being rejected by Unverricht as not demonstrated and exceedingly improbable.

The conclusion is inevitable that at the present time we are not in a position to define "fever" certainly, and that if we accept elevation of temperature as its sole necessary character, we are confronted by the necessity of including in the conception of fever every rise of temperature, even such as is observed under such wholly artificial conditions as hot baths, excessive

exertion, etc. And since it is impossible to define fever as a whole, Unverricht would have us discard the use of the word as indicating any definite state of the body, and would have us for the present consider the elevation of temperature incident to it as an isolated symptom merely, urging its discussion first upon its own merits, irrespectively of other symptoms which may be present at the same time, as has been done with the acceleration of the pulse and respiration, with the headache, the disordered digestion, and the other symptoms which we have been accustomed to group together in the picture of fever. After we have acquired a better understanding of the pathology of each one of these symptoms by itself we may reasonably expect to be in a position to understand something of their interrelationship.

In the discussion which followed the reading of these papers, VON JAKSCH insisted that elevation of temperature is of much less importance as a part of "fever" than the nutritional changes which are incident to it, and which result in the formation of acid compounds, thereby reducing the alkalinity of the blood and of the body-fluids.

UNVERRICHT expressed much satisfaction with the conclusions reached by Kast, reminding the Congress that since 1882 he had maintained that the injurious effect of elevation of temperature had not been demonstrated and that more recent developments have advanced much in favor of the theory that a distinctly useful part is played by the fever-heat in the combat of infectious processes. There is even clinical support for this latter view in the pneumonia of old age, in which there is usually little if any febrile elevation of temperature, for it is matter of common experience that those cases of senile pneumonia do best in which fever is present.

And Unverricht concludes that, although we may not at present be able to explain all the phenomena of fever, one thing is clear, that we should cease to regard elevation of temperature as the cardinal symptom for therapeutic attack in the infecious diseases, but that we should look upon it as a part of the natural history, so to speak, of the disease, interference with which is more likely to do harm than good in the ultimate progress of the disease.

[We are sure that everyone who carefully considers this question must agree with the conclusion of Unverricht. Every recent advance in our knowledge of the infectious diseases has made it more evident that we must regard the symptoms of those diseases as a natural reaction of the body to the infection, and that the degree of intensity of this reaction is to a very considerable extent an index of the vigor of the combat which the tissues are making against the infectious agent. Viewed thus, the grave responsibility of the therapeutist, who deliberately interferes with the natural progress of a disease which in the end tends to recovery, must be apparent. "Meddlesome midwifery" has been decried for generations. Should we not now as squarely denounce all irrational and meddlesome therapy? Our present effort should be to gain a thorough knowledge of the processes instituted by the body in its combat with infectious material. When possessed of this we may be able by radical means to aid the body to recovery; but we are sure at the start that the measures then indicated will not be such as materially interfere with the processes instituted by the body.—ED.]

Endocarditis as a Complication of Gonorrhœa.

A careful review of the literature of gonorrhœa, in so far as it bears upon complication of that disease by endocarditis or pyæmia, has led Thayer and Blumer to concur with Finger in the opinion that there are four possible modes of secondary infection of the system incident to gonorrhœa—viz., the secondary infection may be due to the invasion of the system (1) by the gonococcus itself, (2) by associated bacteria (*staphylococcus, streptococcus*, etc.), (3) by both gonococcus and the associated bacteria, and (4) by absorption of the toxic products of the gonococcus.—*Archives de Méd. expér. et d'Anat. path.*, 1895.

In illustration of the first of these modes of secondary infection they present the details of a new case of pyæmic endocarditis complicating gonorrhœa in which gonococci were detected in and cultivated from the circulating blood. Several cubic centimetres of blood taken from the arm vein were mixed with nutrient agar in the proportion of 1 : 3 and plated. Small colonies developed, presenting the characters of gonococci colonies, not growing on the usual media, but developing abundantly on Wertheim's special medium. The autopsy showed recent ulcerative endocarditis in which were many microorganisms having the morphological peculiarities of the gonococcus, but cultures made from these structures remained sterile. There seems to be no reasonable doubt, however, that the germs found by culture during life in the blood and those found morphologically in the heart-lesions after death were identical and that the secondary lesion was due in fact to an invasion of the system by the gonococcus.

Inguinal Hernia of Enormous Size.

An extraordinary case of inguinal hernia is reported by M. Ungauer in the *Bulletin de la Société anatomique de Paris*, 1896, 352. The contents of the sac weighed thirteen pounds and consisted of the entire alimentary tract with the exception of the upper portion of the stomach, the second and third portions of the duodenum and ileo-pelvic portion of the descending colon. The spleen and kidneys occupied their normal positions, as did also the liver, which was, however, greatly enlarged and extremely fatty. The pancreas was turned so that its long diameter lay in the axis of the body. Notwithstanding this great displacement of the abdominal contents there was no noticeable impairment of the alimentary function. The appetite was good, the bowels were regular, and digestion and assimilation appeared to be normal.

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CONTENTS.

ORIGINAL COMMUNICATIONS.

PAGE

A Successful Case of Removal of a Large Brain-tumor from the Left Frontal Region—Opening and Packing of the Lateral Ventricle with Iodoform-gauze. By H. M. Thomas, M.D., and W. W. Keen, M.D. 503

The Cerebral Complications of Raynaud's Disease. By William Osler, M.D. . 522

Early Rupture in Extra-uterine Pregnancy and its Treatment. By Fernand Henrotin, M.D. 530

The Therapeutic Value of Hydrobromate of Scopolamine in Plastic Iritis. By Charles A. Oliver, A.M., M.D. 542

On the Identity of the Conditions Commonly Known as Wandering Rash of the Tongue and Moeller's Superficial Glossitis. By J. L Goodale, A.M., M.D. . 545

Massage, Movements, and Bandaging in the Treatment of Displaced Semilunar Cartilages. By Douglas Graham, M.D. 561

The Etiology and Treatment of Venereal Buboes. By J. Clifford Perry, M.D. 571

REVIEWS.

A System of Surgery. In two volumes. Edited by Frederick Treves, F.R.C.S. . 581

Outline of a Clinical Pathology of the Blood. By Dr. Rudolph von Limbeck. With a chapter on the Coagulation of the Blood, by Ernst Freund . . . 585

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

PAGE

Ovarian Therapy 587

Administration of the Pituitary Gland 587

Thyroid Preparations for Goitre . 588

Accidents Chargeable to Serum-therapy 588

Artificial Diphtheria Antitoxin . . 589

Kitasato's Anticholera Serum . . 589

Haffkine's Anticholera Inoculation . 589

Hemorrhagic Septicæmia Treated by Antistreptococcus Serum . . 590

Exceptional Effects of the Bromides . 590

Poisoning by Pyrogallic Acid . . 590

Antitetanic Serum 591

Serum-therapy in Syphilis . . 591

Vaccine Produced by passing the Virus of Smallpox through the Cow and Calf 591

Treatment of Neuralgia by Injections of Osmic Acid 592

Panbotano 592

Pellotin 592

A Case of Cephalic Tetanus . . 593

Eucaine 593

Arsenical Paralysis 594

Treatment of Constipation . . 594

MEDICINE.

Syringomyelia following Traumatism 595

Paralytic Chorea 596

Diabetes Mellitus and Cirrhosis of the Liver 596

Gumma of the Œsophagus . . 597

Pyogenetic Action of the Typhoid Bacillus and Bacillus Coli . . . 598

Prodromal and Secondary Exanthemata 598

Tetany in Childhood 599

Varieties of Typhoid Eruption and their Significance 599

Acute General Infection with Friedländer's Bacillus in a Case of Otitis Media and Empyema of Mastoid . 600

SURGERY.

	PAGE		PAGE
Two Cases of Pulmonary Abscess Treated by Operation	600	Bullet Imbedded in the Brain Photographed by the Röntgen Rays	602
Relation between Malignant Lymphoma and Tuberculosis	601	Radical Cure of Hernia by Operation	603
Rupture of Urethra Treated by External Urethrotomy and Suture	601	Hypertrophy of Prostate Gland	603
		Sterilization of Syringes by Boiling	604
		Argonin in Treatment of Gonorrhœa	605

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Medicinal Catarrh	606	Tuberculosis of the Lymphoid Tissue in the Pharynx	607
Diffuse Papillomatous Degeneration of the Nasal Mucous Membrane	606	Primary Erysipelas of the Pharynx	608
Adenoid Vegetations	606	Acute Primitive Pseudo-membranous Rhino-laryngo Bronchitis	608
Aneurism by Anastomosis Involving the Vessels of the Hard Palate	606	Intubation in the Adult, with Reference to Acute Stenosis of Larynx	609
Varicella of the Larynx	607		

OPHTHALMOLOGY.

Transplantation of Skin-grafts for the Cure of Ectropion	610	Traumatic Prolapse of the Iris	612
Influence of Country and Race in the Etiology of Trachoma	611	Paralytic Squint from Lead-poisoning	612
True Iritis and Uveitis of the Iris	611	Endothelial Lining of Anterior Chamber	612
		Ocular Manifestations of Eye-strain	613
		Illumination and Visual Acuteness	613

OBSTETRICS.

Forceps to the After-coming Head	614	Pregnancy Complicated by Fibromyomata	617
Treatment of Eclampsia	614	Contracted Pelves in the United States	617
Cancer of the Cervix Complicating Pregnancy	616	A Contribution to the Study of Ovulation, Menstruation, and Conception	618
Cervical Pregnancy	616	Extra-uterine Pregnancy	619
A Better Method of Using Glycerin to Induce Labor	616	Frequency of Contracted Pelvis	619

GYNECOLOGY.

Shortening of the Round and Sacro-uterine Ligaments per Vaginam	621	Vesico-fixation of the Uterus	622
Intraperitoneal Shortening of Round Ligaments by Vaginal Section	621	Vaginal Ovariotomy	623
Position of the Normal Ovary	622	Endometrium following Castration	623
		Results of Anterior Colpotomy	624
		Rectal Gonorrhœa in Women	624

HYGIENE AND PUBLIC HEALTH.

Disinfection of Wells during Cholera Epidemics	625	Formaldehyd Gas as a Disinfectant	626
A New Adulterant for the Preservation of Milk	626	Poisonous Action of Sulphuric Acid and its Salts in Foodstuffs	627